NATUR CYMRU

The Nature of Wales

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In this edition:

- Shooting and conservation
- Freshwater pearl mussel
- Cambrian mountains
- Eosiaid
- Moth count
- Dinefwr Park
- Tree lungwort lichens
- Tufted saxifrage

PLUS:
Books, News, Comment...

NATUR CYMRU
The Nature of Wales

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Natur Cymru is intended to promote the exchange of information about biodiversity and encourage debate. If you have information, ideas for articles or artwork which you think might be of interest to readers, please contact the Editor.

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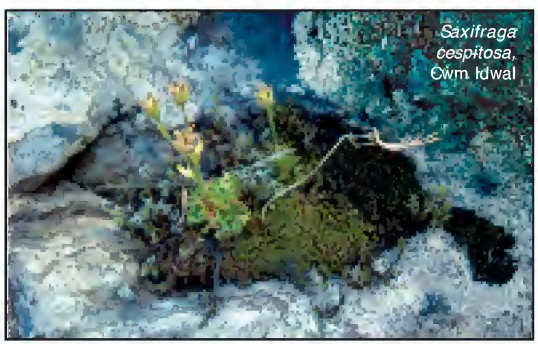
NATUR CYMRU GOLYGYDDOL

Efallai fy mod i'n mynd yn hen, ond yr hydref erbyn hyn yw fy hoff dymor, ac eleni – wedi haf mor ddiflas – rydym yn haeddu cael diwedd toreithiog i'r flwyddyn. Dyma'r adeg pan mae rhostiroedd y glannau ar eu gorau; mae gennym amrywiaeth ehangach o rug yn yr ynysoedd hyn nag yn unlle arall yn y byd, heblaw De Affrica. I mi, does dim yn gallu cymharu â grug y mêl sy'n gorchuddio'r ucheldir a'r clogwyni gyda chwrlid piws tywyll, gan gyferbynnu mor drawiadol gyda melyn tywyll yr eithin mân, neu'r eithin Cymreig fel y mae'r enw Lladin - *Ulex gallii* - yn awgrymu.

Peidiwch â chael eich camarwain gan y cyflwyniad tymhorol hwn. Nid wyf eto wedi derbyn adroddiad am y gwahanol fathau o fadarch a chaws llyffant y gellir eu canfod yn y coedydd a'r caeau yr adeg hon o'r flwyddyn, nac ychwaith arweiniad ar sut i'w hadnabod na chymorth ynghylch pa rai y gallaf eu bwyta. Rwyf yn eich annog i fentro allan i weld drosoch eich hun, ac efallai ymuno â chriw fydd yn mynd allan i chwilio am ffyngoedd. Fe fyddai erthygl yn cofnodi taith o'r fath yn gyfraniad difyr tuag at rifyn y gaeaf.

Mae'n beth da rhoi sylw i bethau llai ysblennydd a llai amlwg ambell dro. Un enghraifft yw'r malwod llawch-with, sef creaduriaid bach sy'n dringo coed ac sy'n eich galluogi, ys dywed Ben Rowson, i edrych i fyny atynt. Mae Ray Woods yn rhoi i ni ychydig o hanes cennau callod y derw. Mae eu dyfodol ymhell o fod yn ddiogel; ond, gyda chymorth technegau trawsblannu arloesol, mae planhigion newydd wedi cael eu sefydlu, gan gynnig gobaith i'r cennau deniadol hyn.

David Parker



Saxifraga cespitosa, Cwm Idwal

Nid ydym wedi clywed llawer o sôn am gadwraeth trwy drawsblannu, ond fe ddechreuwyd arbrofi yng Nghymru gyda'r torfaen siobynnog prin mor bell yn ôl â 1982. Byth ers hynny, cafodd llwyddiant y cynllun ei fonitro gan David Parker, ac wrth wneud hynny darganfuwyd bod newid yn yr hinsawdd yn gwneud Eryri yn fwyfwy anaddas ar gyfer planhigion arctig-alpaidd.

Mae cadwraeth trwy saethu cyn hyned â choedwigoedd – neu cyn hyned â'r New Forest, o leiaf. Mae disgrifiad Alex Hatton o gadwraeth ymarferol yn ein hatgoffa nad y cymhelliad sy'n bwysig yn achos natur, ond y canlyniadau. Os ydym yn fodlon cadw ychydig o le i natur gan ein bod yn hoff o saethu, yna, fel ffermwyr neu reolwyr tir, dylem gael ein parchu am ein hymdrechion dros natur.

Mae Gwarchodfa Natur Genedlaethol newydd wedi ennill ei lle ymhlith y safleoedd arbennig hyn ar gyfer natur. Yn ôl y gyfraith, safleoedd yw'r rhain lle mae cadwraeth ac astudiaethau gwyddonol yn cael y lle blaenaf, gyda buddiannau eraill fel mynediad yn dod yn ail. Ym Mharc Dinefwr fe welir cymysgedd gyfoethog iawn o'r naturiol, y diwylliannol a'r hanesyddol, felly bydd cadw cydbwysedd hapus rhyngddynt yn her i reolwyr y warchodfa ac i'r Ymddiriedolaeth Genedlaethol.

Gobeithio y byddwch yn gweld digon i'ch diddori ac i'ch addysgu yn y rhifyn hwn, boed yn ymwneud â chalon gudd Cymru, mynyddoedd Cambria, cyfrif gwyfynod, neu ymdrechion i adfer niferoedd y misglod perlog sy'n prysur ddiflannu. Rhowch y darllen o'r neilltu ar gyfer nosweithiau tywyll y gaeaf – ewch allan i fwynhau'r hyn a fydd, gobeithio, yn hydref braf a llawn aeddfedrwydd.

James Robertson

NATUR CYMRU EDITORIAL

Maybe it's a sign of ageing, but autumn has become my favourite season. After such a dreary summer, we deserve a golden finale to the year's growth. This is the time that our coastal heaths reach their zenith; we have more members of the heather clan in these Isles than anywhere else in the world except South Africa. For me nothing equals bell heather, painting splashes of deep purple across the uplands and cliff tops, contrasting with the deep yellow of western gorse, or as its Latin name *Ulex gallii* would infer, Welsh gorse.

Do not be misled by this seasonal introduction. I have not secured an account of the multitude of mushrooms and toadstools that can be found in the woods and fields at this time of year, with tips on how to identify them, and perhaps consume with care the odd few. I would encourage you to get out and see what you can find, perhaps joining an organised fungus foray. Perhaps your discoveries could provide a fireside article for the winter edition.

It is good to give attention to less spectacular and obvious subjects. Door snails are one of these, small creatures which climb up trees, so, as Ben Rowson says, you can look up to them. Ray Woods treats us to an account of the tree lungwort lichens. Their outlook is far from secure but, through a pioneering transplanting technique, it has been possible to establish new plants and give hope for these appealing lichens.

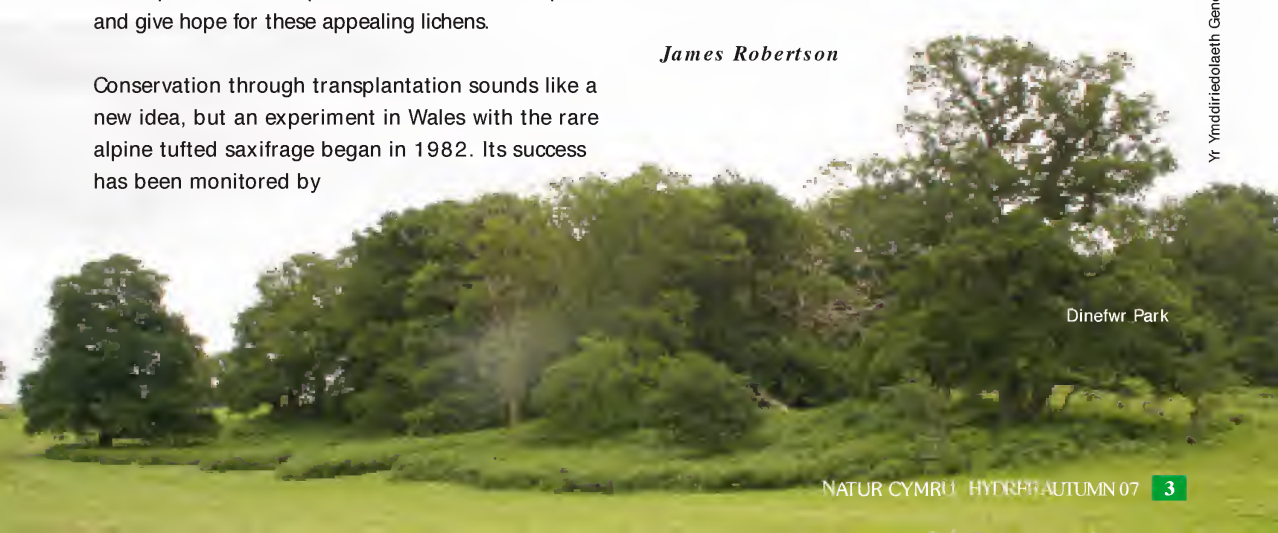
Conservation through transplantation sounds like a new idea, but an experiment in Wales with the rare alpine tufted saxifrage began in 1982. Its success has been monitored by David Parker ever since, with the added twist that a changing climate is leaving Snowdonia's arctic-alpine plants with nowhere to go.

Conservation through shooting is as old as the forests - or the New Forest at least. Alex Hatton's description of boots-on conservation action is a reminder that, where nature is concerned, motivations don't matter; it is results that count. If we are prepared to leave a little space for nature because we love to shoot, then as farmers or land managers we should be respected for our achievements for nature.

A new National Nature Reserve has quietly made its way into the gallery of these special sites for nature. As the law says, these are sites where conservation and scientific study come first, and other interests like access have to fit in with this. Dinefwr Parc has a very rich mix of the natural, cultural and historical, so getting the balance right will keep its managers at the National Trust on their toes.

I hope you find plenty to interest and inform you here, whether about Wales' hidden heart, the Cambrian mountains, moth counting or efforts to re-build disappearing freshwater pearl mussel populations. Keep your reading for the darkening evenings, and get outside to enjoy what I hope will be a fine autumn of mellow fruitfulness.

James Robertson



Yr Ymddiriedolaeth Genedlaethol/The National Trust

Dinefwr Park

BASC

Shooting and conservation - the Green Shoots experience

The cause of conservation is open to anyone who can help, and one group of people in a good position to help are shooters. Harnessing their enthusiasm to help achieve biodiversity goals is the task of a project called Green Shoots. It is leading to better knowledge of our wildlife and practical conservation action, as ***ALEX HATTON*** *explains.*

Changing landscapes at Robin Crossley's farm

In north Wales there are 330 shooting conservationists taking part in the British Association for Shooting and Conservation (BASC) Green Shoots project, a unique collaboration, funded by the Countryside Council for Wales and Environment Agency Wales, between shooting and non-shooting conservationists that brings delivery of biodiversity targets into the wider countryside.

How does the project work?

Green Shoots draws on the knowledge that our members absorb on a day-to-day basis. To get an idea of what habitats, species and management occur on our members' land, we sent out a survey asking them where they shot in north Wales. The survey asked for information about 23 species and 9 habitats, which are included in North Wales Local Biodiversity Action Plans (LBAPs). Maps were provided showing the locations of these species and habitats. The results were amazing: 19% of north Wales is shot over by BASC members and 9000 biological records were generated.

The number of records and its wide coverage mean that this is one of the most comprehensive wildlife studies carried out in the area.

BASC members have a wide array of sporting interests which include: deer stalking; rough shooting; driven shooting; wildfowling and predator control, to name a few. All of these interests are pursued in north Wales. In order for a healthy population of quarry to exist the habitat must be suitable for them.

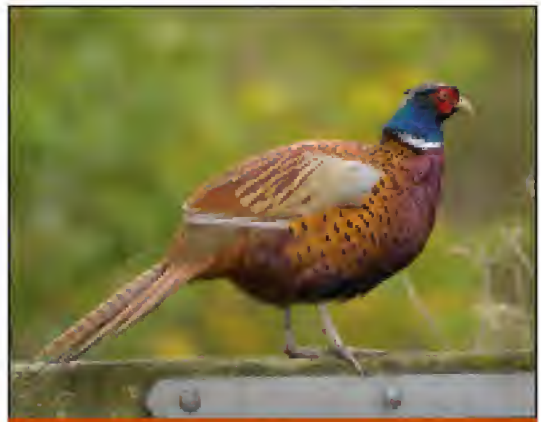
Noel Hulmston runs a wild bird shoot in the Chwilog area, which is focused mainly on woodcock *Scolopax rusticola* and snipe *Gallinago gallinago*, with some 40 pheasants being put down in 2006 to establish a wild population. He holds six days' shooting a year for four invited guests, averaging a bag of between one to six birds. He has an interesting relationship with three neighbouring landowners from whom he rents the shooting rights. Unlike many pheasant shoots where work goes on in set woodlands and covers, Noel runs a shoot over an area of land that contains marshes, woodlands, thick hedges and gorse, all of which are farmed.

As no shoot had been run here before, he started from scratch. North-west Wales has an influx of wintering woodcock each winter, but if the conditions are not right they will not winter on your land, so to run a wild bird shoot you must first attain favourable habitat conditions.

In year one Noel decided that before any shooting took place that he must first see what nature had to offer. He assessed what game birds were already there, and in what numbers. Then he surveyed the wildlife to gain a benchmark from which he could assess how future changes affected them. It was after this first year that Noel was able to approach his three landowners and propose some changes to the grazing management of the land as well as carrying out some habitat work to improve the shoot.

Bird counts

Noel spends four or five days a week on the shoot and monitors the wildlife he sees on every visit. He chose robins *Erithacus rubecula* and long-tailed tits *Aegithalos caudatus* as good indicator species of conservation change and improvement. In year one these species were infrequent. Today Noel's counts have shown long-tailed tits to have almost tripled in numbers and robins are to be seen on almost the entire shoot. Barn owls *Tyto alba* are now regularly seen and this year nesting boxes were erected. Ring ouzels *Turdus torquatus*, green woodpecker *Picus viridis*, and a whole host of dragonflies, butterflies and moths are recorded on these visits and records passed on through the Green Shoots project to the local records centre, Cofnod.


©RSPB Sue Tranter

Pheasant

Noel is striving for better things and his current 'eight year plan', which grows daily, details his plans for the shoot. For someone who does not own the land it is fantastic to see how his enthusiasm is translated into work following regular meetings with the three landowners. One of Noel's future plans is to encourage water voles *Arvicola terrestris* back to the shoot by managing the habitat to suit them. He intends to fence off certain areas to discourage the cattle and he will also be controlling mink through the use of mink rafts. June 2007 saw the start of an education programme. Local schools were invited to help place bat and owl boxes and learn a little about practical nature conservation, essential if we are to stimulate the conservationists of the future.

Noel's shoot is a prime example of how nature and

Alex Hatton BASC

Barn owl box going up on a shoot

shooting not only co-exist but depend on one another. Nature gains huge benefits from the shoot, and when wildlife thrives, the shoot does as well.

Robin Crossley's love of wildlife and the outdoors started from a very early age. Growing up on a farm and exploring the land whenever possible nurtured his interest. Robin believes he never really grew up from those days spent paddling in the stream, so when he took on the farm near Llanfair Talhaiarn he had the opportunity to express himself in landscape-scale work. This started with digging ponds here and there, then expanding them to lakes, and to date he has dug approximately 40 ponds. Why? Because he finds them very pleasing to the eye and they seem to attract all sorts of wildlife.

Robin's farm was once intensively grazed by sheep, a pressure put on him by having to make a living from the land. Every minute was precious and it was his need to speed things up that helped him diversify. Robin recalls fencing out all the ditches and rough areas that his livestock might get stuck in so he could save himself time by not having to check those areas on a day to day basis. As these rough areas flourished with the reduction in grazing, and as the farm was not enough to live on, it was natural that he should diversify and start a small pheasant shoot.

The shoot grew over the years and in order to increase the number of pheasants put down, he needed more cover. So more woodlands were planted, cover crops sown on a yearly basis and sheep numbers reduced; Robin was moving with the times, and the landscape was changing with him.

Spreading improvements

In 2006 Conwy's Habitat Improvement Projects (CHIPs) fund, run by Conwy Countryside Service and Coed Cymru, paid for a 1,410 metre wildlife corridor that links up the pheasant pens with the isolated covers higher up the farm, as well as planting a further 7,825 trees amounting to 1.57ha of new woodland. This was beneficial to the shoot but was equally important to wildlife, offering scope for species to move as climate change affects the ranges of our wildlife.

Once Robin became involved, his neighbours followed suit. His sister, whose land Robin also manages for shooting, had a huge amount of work carried out with some 6,000 trees being planted as well as a variety of other work. His other neighbours have become involved in fencing riverside corridors.

A view from the top of the shoot now encapsulates the landscape changes and consequent benefits that shooting makes to conservation. One area of the

BASC

One of the many ponds at Robin's farm

farm that once was an open field now has 20 or so small woods linked up by wildlife corridors with a series of lakes dotted throughout.

These examples are all BASC members participating in the Green Shoots in North Wales programme. Not everyone can contribute on a whole shoot basis as these have done. Many smaller projects are running that are suited to such people. In north-east Wales a barn owl project is running that aims at surveying the habitat to identify which estates and shoots are suitable for receiving barn owl boxes. In Snowdonia National Park one shoot had a highly probable sighting of a pine marten *Martes martes*, scored for reliability by the Vincent Wildlife Trust. Subsequently pine marten breeding boxes have been erected with the hope of enticing the martens back to breed. Why are they there? It may be due to a reduction in predator numbers, for example foxes, and an increased abundance of pheasants and small mammals. In Anglesey and Gwynedd members are participating in mink trapping using mink rafts, as well as learning how to sensitively manage for water voles.

Green Shoots gives our members a link to non-shooting conservationists that is not something that often happens. Regular records come back to the project officer and are followed up or passed on as appropriate. Only a few months ago a corncrake *Crex crex* was heard on a shoot near Pwll Trap. The habitat was ideal and the record is being followed up by the RSPB.

Shooters are already doing a great deal for conservation, but much of this is unrecorded and unseen by the general public. They are the eyes and the ears of the countryside that should not be overlooked. Green Shoots aims to maximise the potential of BASC members by getting them involved in projects and pointing them towards local opportunities, such as training, funding and open days. They are normal people who know and love the countryside and, given the opportunity, are proud to show off what they have done for conservation.

Alex Hatton is North Wales Biodiversity Project Officer for BASC.

©RSPB Stanley Porter

Woodcock in perfect camouflage

Codi pontydd ym myd cadwraeth

Mae prosiect *Green Shoots* yn annog helwyr i gyfrannu at dargedau bioamrywiaeth ac mae'r canlyniadau, hyd yn hyn, yn galonogol iawn. Mae aelodau BASC eisoes wedi cynhyrchu 9000 cofnod bywydegol o diroedd hela ar hyd a lled gogledd Cymru. Mae aelodau unigol yn cyflawni gwaith arbennig hefyd. Yn Chwilog, er enghraifft, mae Noel Hulmston yn cynnal menter saethu fasnachol mewn cydweithrediad â thri ffermwr lleol; er mai gwella cynefin ar gyfer cyffylog yw'r prif nod, mae adar eraill, fel titwod cynffon hir, tylluanod gwyn a mwyeilch y mynydd wedi cynyddu dros y blynyddoedd. Yn Llanfair Talhaearn mae brwdfrydedd Robin Crossley wedi trawsnewid tir agored ac undonog yn frithwaith o goetir, gwrychoedd a llynnoedd wrth iddo arallgyfeirio o gadw defaid i hela ffesantod. Ac mae ei ddylanwad yn bellgyrhaeddol; ar dir cyfagos, plannodd ei chwaer 8,000 o goed ac mae ei gymdogion eraill wedi bod wrthi'n ffensio ar hyd glannau afonydd.

Nid pawb sy'n gallu gwneud gwaith cyffelyb ar y fath raddfa, ond mae cyfle i'r holl aelodau gyfrannu mewn gwahanol ffyrdd – er enghraifft, drwy gynnal arolwg o gynefinoedd addas ar gyfer tylluanod gwynion, gosod blychau ar gyfer bele'r coed, dal mincod neu ddysgu sut i reoli cynefin ar gyfer llygod pengrwn y dŵr.

The Freshwater Pearl Mussel

Environment Agency Wales

Richard Burkmar

Captive-reared juvenile mussels

Environment Agency Wales

A beautiful Eifionydd river, home to pearl mussels

In the first edition of this magazine, Graham Oliver raised the spectre that the freshwater pearl mussel might be in terminal decline. Did we have the time to wait for important rivers to recover, and in the meantime should we consider culture methods and the artificial maintenance of stocks, he asked. ***HUW JONES*** *reports on a successful captive rearing project, but explains that the real challenge remains bringing important mussel rivers back to health.*

What makes the demise of the freshwater pearl mussel so tragic is that it was once relatively common in Welsh rivers. Some rivers were likely to have held tens if not hundreds of thousands of mussels. The decline which Graham Oliver wrote about in this magazine six years ago has continued, so that the species is now effectively extinct in south Wales. Even the larger populations found in north-west Wales face a similar fate unless effective action is taken to conserve the mussel. Given that over 15 Welsh rivers once held pearl mussels, it is a sad state of affairs when it is almost extinct in most of these and the largest Welsh population of this species is now counted in the hundreds.

The freshwater pearl mussel *Margaritifera margaritifera* is a long-lived bivalve mollusc found in Western Europe from Russia to as far south as Portugal, as well as in North America. It has evolved closely in association with salmon and trout and its life cycle is entirely dependent on a parasitic phase in which mussel larvae attach and overwinter on the gills of small trout and salmon parr. This may actually benefit the parr by boosting the immunity of the fish to disease in the longer term.

Throughout Britain the species is found from Cornwall through Wales, Ireland, northern England and into Scotland. Unfortunately the only populations that could be described as healthy are now restricted to Scotland and western Ireland. In Wales the species was certainly once very common, with fisheries for the mussels' pearls recorded as far back as Roman times on the Conwy. Other Welsh rivers such as the Dee and Wye were also noted as pearl fisheries in more modern times, with pearl fishing recorded from smaller rivers like the Gwyrfai, Llugwy and Taf (west Wales) during the mid-20th century[1]. Whilst now an illegal activity, pearl fishing has certainly contributed to localised extinction of the species by destructive removal of the mussel broodstock, as the pearl fishermen removed and killed the larger adult mussels. However, pearl fishing is unlikely to be such a threat these days, because of the scarcity of mussels and the deterrent effect of possible prosecution under the Wildlife and Countryside Act.

The main threat to the pearl mussel is ageing mussels and a lack of young mussels to take their place as they die. The longevity of the species - a pearl mussel can live to be a 100 years old in ideal circumstances - can mask underlying declines in a particular population. The presence or lack of juvenile mussel recruitment can be demonstrated by undertaking size distribution profiles of mussel populations. In a healthy population there should be a bias in favour of smaller younger mussels, with older mussels comprising a lesser part of the population structure. The absence of any small mussels (0-30mm in length) in Welsh populations is indicative of a failure in juvenile recruitment of the species, with the populations comprised of older senescent mussels.

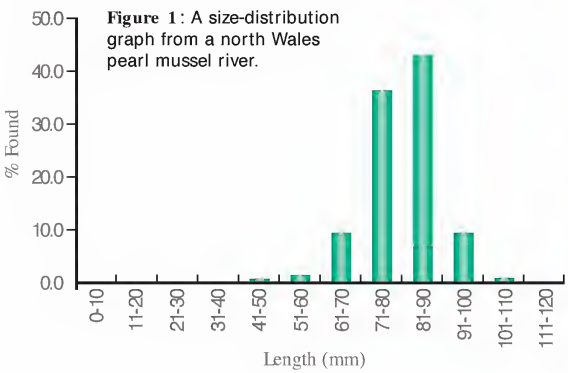


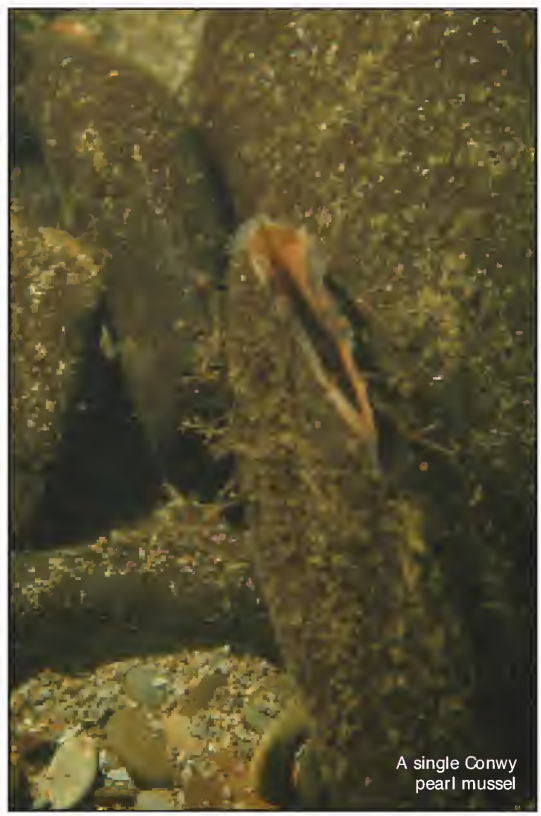
Figure 1: A size-distribution graph from a north Wales pearl mussel river.

Reasons for decline

The underlying reasons for the absence of juvenile mussels are unlikely to be due to a lack of trout and salmon to act as host fish, as it is believed even low host fish densities can sustain pearl mussel populations[2].

Synthetic pyrethroids used as sheep dip have had localised and catastrophic impacts on invertebrates and fish in rivers. However, they do not appear to have affected any pearl mussel rivers, and their sale has now been banned.

Habitat destruction has certainly played a part. The notorious dredging of the Afon Ddu in the mid-1990s caused the almost total loss of what had been previously a healthy, but unrecorded, population of mussels with juveniles present. Similar work carried out in the 1950s and 60s may well have affected mussels in other rivers in Wales, although evidence to confirm this is scant. On the Afon Ddu the Environment Agency



Countryside Council for Wales

A single Conwy pearl mussel

Environment Agency Wales

Fenced out water course

Wales (EAW), Snowdonia National Park and Countryside Council for Wales (CCW) have restored a section of damaged river to its previous state. Although it will take many years, the hope is that the recreated habitat will encourage breeding amongst the remnant pearl mussels found there.

Many would consider the Welsh rivers where the pearl mussels are found to be amongst the cleanest in the country, free from industrial and urban pollution. River quality analysis carried out by the Environment Agency classifies them as good or very good for chemical water quality and biological quality indicators. Yet even on these rivers pearl mussels may be at risk from nutrient input and siltation of the gravel beds where the mussels are found. The sources of this pollution are varied and diffuse, but the main source in upland and rural areas is from the agricultural sector, although other sources such as domestic dwellings and forestry do also contribute to the problem.

The increased availability of phosphate in rivers encourages algal growth. In a pristine river where pearl mussels would be found, the amount of phosphate[3] would be expected to be less than $0.03 mgl^{-1}$. Unfortunately factors such as soil erosion, run-off from farmyards or feeding areas, and run-off from forestry operations as well as other sources mean that the levels of nutrients in Welsh rivers are periodically far higher than they should be in a 'natural' scenario. Surges in phosphate mainly occur after periods of heavy rain, which wash it off the land into streams and rivers: because such events are short lived it is difficult for routine river quality monitoring to pick up these peaks, so the true extent of the problem may not be apparent. The problem manifests itself as the phosphate encourages prolific growth of algae on the gravel beds. This eventually causes the interstitial gravel to become clogged and de-oxygenated, leading to the death of juvenile mussels buried in the gravel.

The future of the pearl mussel depends on addressing this issue of diffuse pollution, by encouraging sensitive land management techniques and good practice. Influencing farmers to take the greatest care in managing their landholdings - particularly the riparian zone along ditches, streams and rivers - must be a priority. The use of Tir Gofal as a tool to influence land management has great potential. However, on a catchment scale the absence in Wales of a higher level component to Tir Gofal that would allow management agreements to be targeted along a continuous riparian zone - irrespective of landownership - is a

Environment Agency Wales

Afon Ddu, before restoration...

...and after restoration

Environment Agency Wales

significant handicap. Fencing out watercourses to manage stock access is of obvious value in conserving the pearl mussel, and this has already been carried out to a significant extent on several rivers through schemes like Rhaglen Tir Eryri in Snowdonia, Natur Gwynedd and EAW funded work.

Forestry practice has changed significantly in recent years, incorporating wide riparian zones free of acidifying conifers in forest design plans. Such changes should benefit pearl mussels and other river life over the coming decades. Even individual households within sensitive catchments can do their bit by opting to use phosphate free cleaning products.

Direct action

Captive rearing offers a quicker remedy to the problem. The idea of captively rearing pearl mussels has been around for some time, and pioneering work had already been carried out in the Czech Republic, Scotland and Northern Ireland prior to the work in Wales. The EAW, CCW and numerous other partners have joined together to establish a captive-rearing project based at four Welsh salmon and trout hatcheries. This takes advantage of the parasitic phase of the mussels' lifecycle in an environment where the uncertainties of the wild river are removed.

The work first involved the collection of the adult mussels from the wild. It is necessary to collect mussels from each individual population in the rivers in Wales as maintenance of genetic distinction is a key part of the project. Initially 15-25 were collected from the Dee, Conwy, Ddu and Eden during summer 2005. These were closely observed and in summer 2006 a further number of mussels were collected from each river to bring the total number of captive broodstock mussels up to 50.

The mussels are kept in a small tank half filled with clean river gravel for them to bed into. Water flowing from the tank is then fed into a second much larger tank in which juvenile trout or salmon are kept. The male mussels release sperm that fertilise the female mussels in early spring: the females then brood and produce larval glochidia which are 'spatted' into the water in late summer. These glochidia, which are released by the tens of thousand, need to attach to the gills of a suitable host fish where they encyst over the winter months.

Rising water temperatures in late spring cause the encysted glochidia to transform into juvenile mussels which excyst and fall off the fish. If this were to occur in the wild then juvenile mussels would hopefully fall onto clean gravel beds into which they would burrow and grow on for several years until large enough to emerge as fully fledged filter feeding mussels. However, in the hatchery the juvenile mussels fall off the fish onto the plastic base of the rearing tank from where they are eventually drained into a fine sieving net and collected. The mussels are then transferred into floating trays in water filled troughs. These trays have a fine mesh bottom and a layer of sandy gravel is placed in them into which the mussels burrow. They are regularly counted and monitored. The work is still experimental at this stage, but funding from

Adfer perlau'r afonydd

Arferai misglod dŵr croyw fod yn gyffredin. Bellach, dim ond rhai cannoedd sydd ar ôl yn afonydd Cymru. a rheiny'n rhai hen iawn. Bu pobl yn pysgota perlau ers cyfnod y Rhufeiniaid hyd at ganol yr 20G. Er yn anghyfreithlon nawr, mae'n siŵr bod hyn wedi cyfrannu at dranc y misglod.

Ond dirywiad yn ansawdd y cynefin sy'n bennaf gyfrifol am y sefyllfa bresennol. Gall gweithgareddau fel carthu fod yn ddinistriol iawn mewn ambell fan ond mae cynnydd mewn maetholion, yn arbennig ffosffad, yn ffactor allweddol ym mhob man. Mae ffosffad yn annog lledaeniad algâu ar welyau graean; mae'r tyfiant hwn yn llyncu ocsigen ac yn tagu'r misglod oddi tanodd. Er bod cynlluniau fel Tir Gofal yn werthfawr, mae gwir angen cynllun sy'n tacio dalgylchoedd dŵr ac afonydd cyfan.

Mae ymdrech ar y gweill i fagu misglod mewn tanciau. Llwyddwyd tyfu 70,000 yn 2006. Mae presenoldeb eogiaid neu frithyll yn hanfodol, gan fod y larfâu'n glynu at y tagelli er mwyn datblygu'n fisglod ifanc. Gall gymryd degawd i'r rhain dyfu'n ddigon mawr i gael eu gollwng. Dim ond cyfran o'r misglod a fagwyd fydd yn tyfu'n oedolion. Er y bydd ail-gyflwyno rhai cannoedd yn helpu atal difodiant y creadur hwn, y nod pennaf yw adfer cyflwr afonydd fel y gall misglod, a phob math o greaduriaid eraill, oroesi heb y math yma o ymyrraeth.

the National Assembly for Wales and CCW means that the project should be able to run for at least five years.

So far this work has been very successful, with 70,000 juvenile mussels being produced in 2006. Not all of these mussels will survive to adulthood, as juvenile mortality in the first years of the pearl mussel's life is very high, even under ideal conditions. Mussels will probably have to be reared to a size of 20-30mm before they can be released in the wild, which may take a decade or more to achieve. But even a modest output of a few hundred captive reared mussels that can be introduced into declining populations will halt the longer term decline until catchment-wide measures addressing water quality issues become effective. On large rivers like the Teifi, Wye and Dee, a fall back option is to release the mussels into tributary streams of the main rivers should the water and habitat quality be more suitable. Another long-term option is to release fish pre-infected with glochidia into the rivers to try and boost mussel numbers. Although it is invaluable in the shorter term, captive rearing must not detract from the conservation efforts to address the underlying issues of the mussels' decline in the wild.

Restoring our rivers to a state where pearl mussels can thrive without the need for intervention is the ultimate aim of all current projects. Of course it is not only pearl mussels that will be benefit from this work: fish, riparian mammals, birds and other invertebrate species also gain from improved water quality. Increasing the number of trout and salmon in our rivers will bring economic gains to the immediate area in the form of angling tourism, proving that it is not only the pearl mussel's ability to produce gems that can bring wealth!

Environment Agency Wales

Mussels growing in a tank

Huw Jones works for the Environment Agency (Wales) as a Biodiversity Officer, based in Bangor.

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The Cambrian Mountains

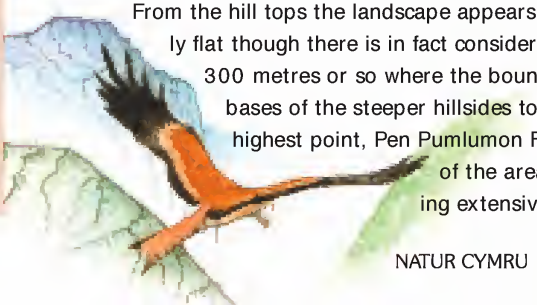
Wales' wild, neglected quarter?

All photos: Liz Fleming-Williams

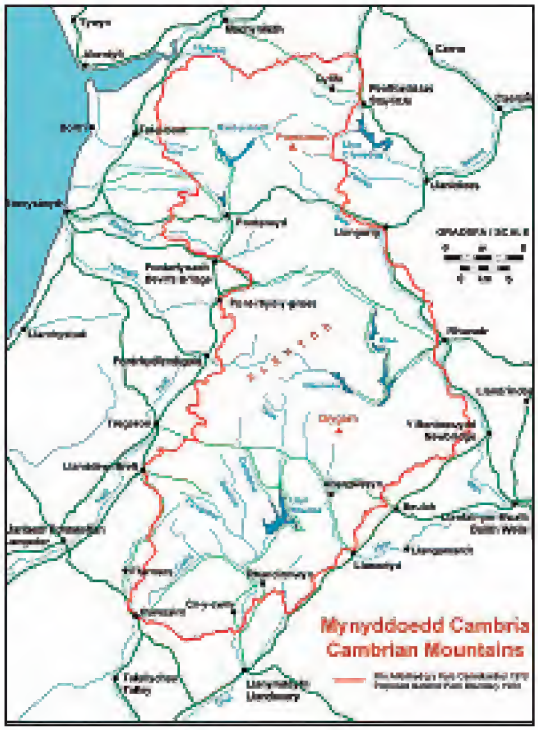
The River Elan in winter

This remote and beautiful area now has an organisation to champion it: the Cambrian Mountains Society argues that the environment and landscape must be at the heart of efforts to build a strengthened economy and social structure. Here ***DAVID BATEMAN*** *and* ***ROGER BRAY*** *describe the exceptional qualities of the Cambrian Mountains, consider current concerns and look to the future.*

On older maps the term 'Cambrian Mountains' often appears to apply to most of upland Wales but in recent years its meaning has become more precise and more localised. It now refers only to the central part of the upland spine of Wales – Pumlumon, Elenydd, and Mynydd Mallaen – occupying most of the space between the Snowdonia and Brecon Beacons National Parks. The map indicates the more precise definition that was used to identify the 120,000 hectare Cambrian Mountains National Park when it was designated (but not confirmed) in the 1970s. Unless the contrary is stated, it is this narrower area that is being referred to in this article.



From the hill tops the landscape appears to be almost uniformly flat though there is in fact considerable variation – from 300 metres or so where the boundary follows the bases of the steeper hillsides to 752 metres at the highest point, Pen Pumlumon Fawr (Plynlimon). Most of the area is moorland, providing extensive hill grazing for



sheep. The remainder mainly comprises conifer forest and large reservoirs. Native woodland is largely confined to steep hillsides, and the farmsteads and enclosed fields occupy the more fertile valleys. There are no significant towns within the area, but there is a necklace of attractive small towns and villages round the periphery.

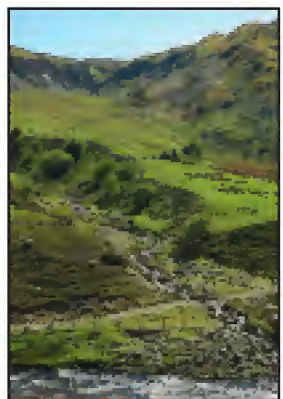
A declining population

Politically, the Cambrian Mountains include parts of three unitary authority areas – Powys (about 50% of the total area), Ceredigion (40%) and Carmarthenshire (10%). These three counties have a combined population of 374,000, all within easy striking distance. We estimate the population of the designated area to be only some 4,500-5,000[1]: more than half have at least some knowledge of Welsh. Mining and agriculture have constituted the backbone of the economy. As employment in both these industries declined throughout the 20th century the main problem became one of rural depopulation. Now, population is growing in mid Wales as a whole, but many of the incomers are retired rather than coming to take employment. In the designated area, agriculture (mainly hill sheep) remains the most important industry, providing an income to an estimated 20% of the working population.

Above all, what distinguishes the area is its feel of remoteness. Despite the extensive impact of people over thousands of years, there is still a quality of apparent wilderness. It is the area of England and Wales least affected by light pollution. Bronze Age remains (often destroyed elsewhere) are still widespread, and much of the area is open access under the Countryside and Rights of Way Act (large tracts are common land). It is possible to walk all day without coming across a tarred road or even a person. Nearly a century and a half ago, the traveller George Borrow, in *Wild Wales* (1862), described "A mountainous wilderness...a waste of russet-coloured hills", where "No signs of life or cultivation were to be discovered..." More recently, in *Wales and the Welsh* (1972), Trevor Fishlock put it this way: “Here is a kind of loneliness and a natural hostility that I can recommend if you feel like being put in your place.”

Landscape

Stapledon[2] in 1936 was the first to suggest a national park in the Cambrian Mountains. He was followed by two official publications which recommended different landscape designations, a National Park by Dower[3] in 1945 and a Conservation Area by Hobhouse[4] in 1947.


Graig Ddu, Cwm Ystwyth

A Countryside Commission report[5] provided the first comprehensive assessment of the Cambrian Mountains landscape in 1990. It identified four broad landscape types (upland plateaux, plateau margins, narrow valleys and broad valleys) which were subdivided to give 19 types, all of which were described in

detail and mapped. The report confirmed the national (UK) importance of its landscape quality. It is a good example of the fact that the most extensive 'wild' landscapes in Britain are not always found within national parks or AONBs, as Carver[6] shows.

Maenserth Stone

More recently the extensive historical importance has been confirmed. *Landscapes of Outstanding Historic Interest in Wales*[7] has mapped and described three areas within the Cambrian Mountains - upland Ceredigion, Dolaucothi and the upper part of the Tywi Valley. It has been followed by the companion work, *Landscapes of Special Historic Interest in Wales*[8], which includes Cwm Elan and part of the Clywedog Valley.

In the absence of official national recognition of its landscape quality it is left to the Local Authorities to use their county development plans to draw attention to the Cambrian Mountains in the planning system, by using their Special Landscape Area (SLA) designation powers. In this way, over the last 30 years, the county councils of Dyfed, Powys, Carmarthenshire and Ceredigion have, at one time or another, identified SLAs within their sectors of the Cambrian Mountains.

Biodiversity

While the absence of official landscape designations is surprising, the ecological importance of the Cambrian Mountains based on Welsh, British and International criteria, is well recognised. In 1986, 72,000 ha became an Environmentally Sensitive Area, a further 80,000 ha being added in 1987.

There are 59 Sites of Special Scientific Interest, 13 of which straddle the boundary. There are six Special Areas of Conservation wholly or partly within the area - Cwm Doethie-Mynydd Mallaen, Elenydd, Rheidol woods and gorge, Elan Valley woodlands, the Afon Teifi and the River Wye. Elenydd-Mallaen, covering over 30,000 ha, is also designated a Special Protection Area for its ornithological importance. Together this exceptional concentration of sites forms part of the Europe-wide network of protected wildlife areas known as *Natura 2000*. The Earth Summit in 1992 led to the UK's Biodiversity Action Plan. This identified 32 terrestrial priority habitats for special attention[9] and 15 of these occur within the Cambrian Mountains. They include blanket bog, heathland and oakwoods. Recently more habitats have been proposed for the priority list, for example upland lakes, wood-pasture and parkland, fine examples of which occur in the area.

Such variety occurring within one of the largest tracts of semi-natural habitats in Wales supports a rich diversity of plant and animal species, with 35 on the UK and Wales Priority/Principal lists. A few red squirrels survive and, of the predatory mammals, otters and polecats are widespread. The variety of breeding birds is exceptional; for many people, these mountains were best known as being the last refuge of the British population of the iconic red kite, now much more widespread. The oak woodlands support abundant mosses, ferns and lichens, many rare or scarce in Britain.

Changes over the last century

Metal mining, mainly for lead and zinc, had declined significantly by the 1920s but the remains of the workings, both above and below ground, occur widely. Construction of the Elan Valley reservoirs started in the 1890s to provide water to the Midlands and there followed the dams at Nant-y-moch on the Rheidol for hydropower, and Brianne on the Tywi for river regulation.

In recent years by far the greatest impacts on the Cambrian Mountains, both on the landscape and the ecology, were afforestation and agricultural improvement. About one third of the sheepwalks of the 1930s

Gathering sheep in Marchnant, Cwm Caerwen

were planted with conifers, mainly between the 1950s and early 1970s. In addition native broadleaved woodland was converted to conifer crops.

The postwar period also saw extensive improvements to the hill grazings. The Mid Wales Upland Study[10] recorded that the rate of agricultural reclamation of rough pasture in mid Wales was one of the highest in upland Britain. The report summarises the Annual Agricultural Census data to show that only 51% of the freehold rough grazing in 1946 remained in 1981. With the greatly increased numbers of sheep, purple moor grass has become even more abundant over large areas and the spread of bracken is partly attributed to fewer cattle on the hills.

Peat cutting for fuel was never an extensive activity and most loss of peat can be attributed to a combination of overgrazing, fire and atmospheric pollution. Undisturbed peatlands can store vast quantities of water but afforestation and pasture improvement over past decades has compromised the upland's capacity to absorb and retain the high rainfall.

Tourism has increased but, unlike Snowdonia and the Brecon Beacons, the area remains largely unknown to most tourists apart from the Elan Valley reservoirs, Devils Bridge, Nant yr Arian or Llyn Brianne. The Cambrian Way is here but in general tourists have not discovered Pumlumon, let alone Drygarn Fawr. The more recent Glyndŵr's Way National Trail attracts walkers to the northern fringe and both the Severn Way and the Wye Valley Walk start on Pumlumon. To both visitors and residents, low-flying military aircraft are an intrusive feature in these remote hills and they can shatter the feeling of peaceful solitude.

Current concerns

Historically, *economic issues* have been the main concern in the area with population decline impacting also on society and culture. With agriculture still the biggest single source of jobs within the area, expected changes in support systems are a major concern for the future[11].

Conservation is the issue that concerns both those who value the apparent wilderness qualities and those who see the future economy as one that will depend to an increasing extent on the attractiveness of these qualities to tourists. Pressures on agriculture may lead to changes in land use, such as ranching or biofuel production. Indeed, with few opportunities for diversification, land could even move out of agriculture altogether into uses with more damaging effects on both landscape and biodiversity as well as on society and culture. Already conservationists are concerned that the replacement of the Environmentally Sensitive Area by Tir Gofal is proving less beneficial than was originally envisaged as resources are diverted to Tir Mynydd.

Some of the forested areas are unproductive and again alternative uses may be even more unattractive. One of these is wind turbines: already there is one large windfarm in the north (Cefn Croes) and others, even bigger, are in the pipeline. There is serious concern over carbon release from peat disturbance as well as more general worries about impacts on landscape, archaeology and historic environment (including the scene of Owain Glyndŵr's famous battle of Hyddgen).

Off-road vehicles are not only common on the hillsides but have also caused significant damage to an ancient track known as the Monks' Trod which links the Cistercian abbeys of Strata Florida and Abbey Cwm-hir. Inappropriate tourist developments, quarrying and mobile phone masts are further possible causes of damage.

Global warming raises new issues. As well as direct environmental effects, rising temperatures may result in the need for new water storage facilities either for water supply or for energy. It could give the Cambrian Mountains an important role in linking areas such as the Brecon Beacons with Snowdonia, in the control of flooding and in acting as a carbon sink. As the major catchment of so many large rivers, the Cambrian Mountains have the potential, through appropriate management, to moderate run-off and flooding downstream. At the same time, better management of the extensive peat bogs could contribute to carbon sequestration.

Underlying all these issues is the lack of official recognition of the area at any level – either UK, Wales, or even in terms of the policies of the counties in which the Cambrian Mountains lie. As a consequence, it is not widely known, visited, or appreciated.

Possible solutions

In response to these problems, a number of ideas have emerged independently in the last couple of years. These include the setting up of the Cambrian Mountains Society (CMS) as a charity, encouraging debate and ideas towards an interrelated approach to environment, economy and community. The concept is to build a strengthened economy and social structure based on landscape and environment – making conservation an economic and social imperative. CMS argues that designation as a new Cambrian Mountains AONB would benefit tourism by giving identity to the area, and would help agriculture by providing the opportunity for a Cambrian Mountains brand for farm produce as well as by increasing opportunities for farm-tourism related income.

Independently of this, the local authorities of Powys, Ceredigion and Carmarthenshire are exploring the idea of an integrated rural development project for the Cambrian Mountains. This proposal has objectives that mirror many of those being advocated by CMS, though it is not at present committed to any form of designation.

The Pumlumon Landscape Project, an initiative of Wildlife Trusts Wales, and the Dyfi Valley Biosphere are two further ideas with some similarities to those above but neither of them covering the whole of the Cambrian Mountains.

Conclusion

The Cambrian Mountains has been a largely forgotten area which is nevertheless important from many points of view: landscape, biodiversity, geodiversity, archaeology, history, society and economy. After many years of drift there is a sudden resurgence of interest.

The view from Pumlumon

Though this is welcomed, there is the possibility that irreversible change could occur unless all of these points of view receive adequate attention. What is required is a serious independent study of the facts and of the wishes of both residents and visitors. To quote the Countryside Commission: "The landscape is much changed from the days when designation as a national park was first considered, when there was such an extent of uninterrupted moorland and such an intricate network of contrasting valleys. Nevertheless, there are still sufficient areas which retain this character to suggest that the landscape remains of national importance, and is on a par with other designated upland areas in both national parks and areas of outstanding natural beauty".

David Bateman is Chairman of the Cambrian Mountains Society. He is Emeritus Professor of Agricultural Economics. ***Roger Bray*** *has worked in wildlife conservation in Wales since 1970 and is a CMS Trustee.*

To join the Cambrian Mountains Society, log into the website at **http://www.cambrian-mountains.co.uk/**

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1. There are no published population figures for the designated area of the Cambrian Mountains – figures used are authors' estimates based on the 2001 Census. (2001 Census Key Statistics: Crown copyright, reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland).
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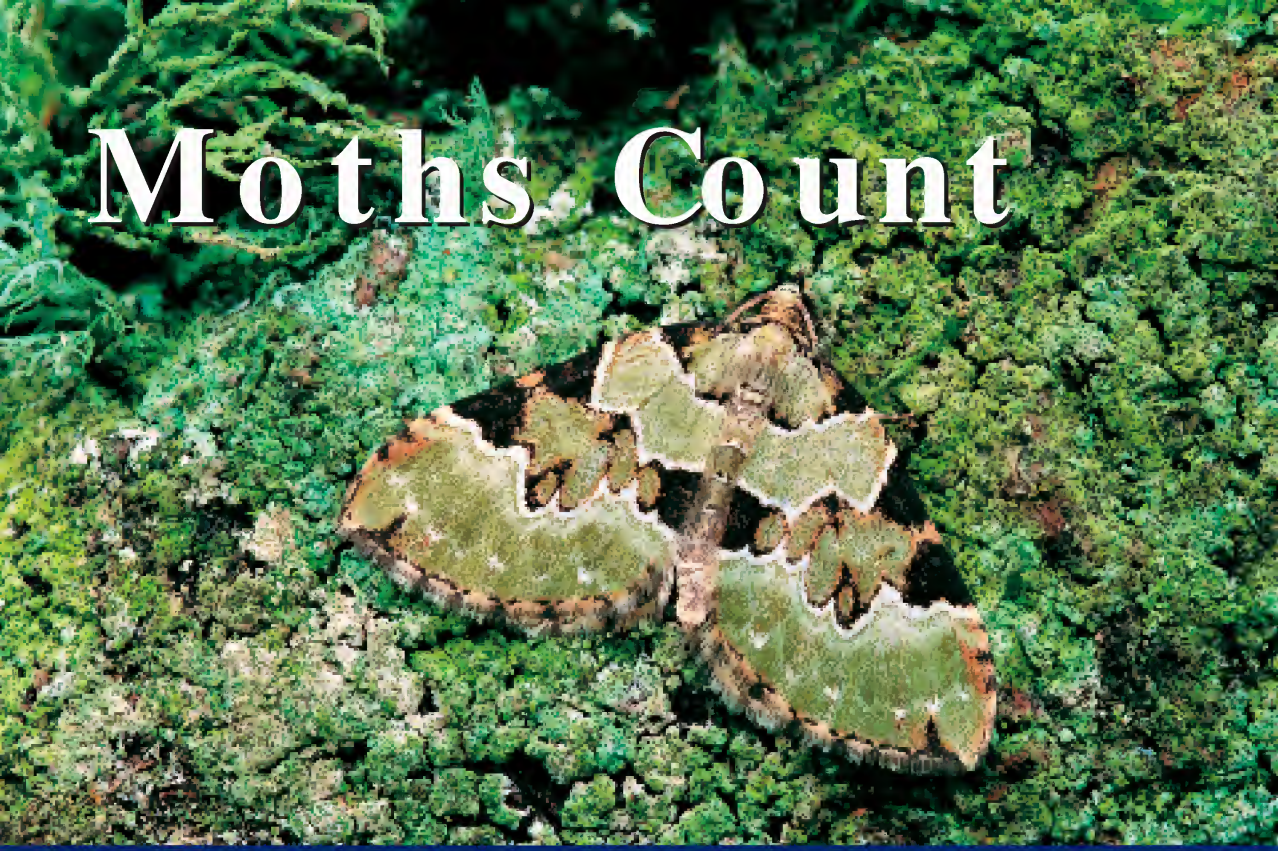
Cynnwrf yn y Canolbarth

Mae ucheldir Pumlumon, Elenydd a Mallaen yn ardal eang sy'n ymestyn dros rannau o siroedd Powys, Ceredigion a Chaerfyrddin. Teimlad gwyllt ac anghysbell sydd i'r mynyddoedd amhoblog hyn. Nôl yng nghanol yr 20fed G, cynigiwyd bod yr ardal yn cael ei dynodi'n Barc Cenedlaethol. Er na ddigwyddodd hynny, mae ansawdd y dirwedd yn arbennig o safbwynt amgylcheddol a hanesyddol. Ceir yma 59 SoDdGA, sy'n cynnwys rhai o gynefinoedd a rhywogaethau pwysicaf Cymru - fel coedwigoedd, gorgorsydd, rhostiroedd, barcutiaid coch a dyfrgwn.

Anodd yw dychmygu'r bwrlwm a fu yma ar un adeg – rhwng y mwyngloddio, y gwelliannau amaethyddol sylweddol wedi'r ail ryfel byd, y coedwigo a'r gwaith o greu cronfeydd dŵr Elan, Nant y Moch a Brianne. Ffermio defaid yw'r diwydiant pennaf yn yr ardal erbyn hyn a phrin yw'r ymwelwyr a ddaw i grwydro llwybrau'r fro. Ond gallai llu o newidiadau posib effeithio'n fawr ar y tirlun hwn; dyfodiad cnydau biodanwydd, diflaniad rheolaeth amaethyddol, tyrbinau gwynt, erydiad gan gerbydau tir garw, yr angen i storio rhagor o ddŵr yng ngwyneb newid hinsawdd. O gael ei rheoli'n briodol gallai'r ardal hefyd leihau dŵr ffo a helpu atal llifogydd yn is lawr yr afon, yn ogystal â chronni carbon yn y mawnogydd. Sefydlwyd Cymdeithas Mynyddoedd Cambriaidd er mwyn annog trafodaeth ynglŷn â dyfodol yr ucheldiroedd hyn ac i geisio sicrhau dynodiad swyddogol ar gyfer yr ardal. Ar yr un pryd mae'r tri awdurdod lleol wrthi'n gweithio ar Brosiect Datblygu Integredig sylweddol, a Chymdeithas Bywyd Gwyllt Cymru yn brysur yn hybu Prosiect Tirlun Pumlumon dros ran o'r ardal.

Gyda'r fath don o frwdfrydedd, mae'n gyfle da i ystyried a chyfannu'r holl safbwyntiau gwahanol er lles y tirlun, yr amgylchedd, yr economi a'r gymdeithas leol.

Moths Count



All photos: Robert Thompson

Numbers of green carpet *Colostygia pectinataria* appear to have increased.

A recent report catalogued declines in moths. A new campaign aims to find out what is happening to them, and to enlist public help on a big scale, as RICHARD FOX *and* ZOË RANDLE *report.*

The world of moths and moth recording is going through a dramatic period. More and more people are taking up an active interest in moth recording. There is a real buzz about mothing at present and why not? Hundreds of species visit an average garden in the course of a year, providing many hours of natural history enjoyment right on your doorstep. Moths have never been so popular, but the moth fauna itself is changing dramatically too[1]. Last year, for example, brought great contrasts; on the positive side, 2006 was perhaps the greatest year on record for the numbers and variety of immigrant moths arriving from overseas. However, this excitement provided only temporary distraction from the gloomy findings of *The State of Britain's Larger Moths* report, published in 2006[2]. Sir David Attenborough described the latter as "significant and worrying" and over 115 Westminster MPs echoed his concern through a motion sponsored by Bridgend MP, Madeleine Moon[3]. The total number of moths in Britain has decreased by a third since the late 1960s and many widespread species, such as the spinach *Eulithis mellinata*, figure of eight *Diloba caeruleocephala* and garden tiger *Arctia caja* have suffered drastic population declines (95%, 95% and 89% decreases respectively over the period 1968-2002)[4].

As the many moth recorders or 'moth-ers' in Wales already know, it is

Feathered thorn *Colotois pennaria* numbers have declined dramatically over recent decades.

easy to be swept along by the wonder, beauty and diversity of moths and the excitement of never knowing what is going to appear in the moth trap. It is less appealing to focus on the evidence for declines and what that might mean. Moths make up a significant part of our biodiversity - 2,500 different species have been recorded in Britain. Moths can act as indicators for the vast wealth of insect wildlife, and play essential roles in the fabric of our environment, from back garden to nature reserve. Birds, bats and many insects depend on moths and their caterpillars for food. It has been estimated that blue tit chicks alone consume at least 35 billion moth caterpillars every year in Britain. Then there are the great tits, blackbirds, robins, starlings, house sparrows, wrens and many other garden birds, not to mention rarities such as the stone curlew, nightjar and grey partridge. As well as being fascinating, moths are important; moths count!

What's it all about?

Butterfly Conservation launched a major new project, **Moths Count**, earlier this year. Moths Count is a partnership of individuals, local groups, government agencies, charities and businesses, all intent on raising public and political awareness of moths, encouraging recording and establishing an ongoing UK-wide National Moth Recording Scheme (NMRS) for the 900+ species of larger (macro-) moths.

The establishment of the NMRS will greatly enhance the existing efforts of moth recorders. There has not been a comprehensive distribution recording scheme for the larger moths since the early 1980s (although the Rothamsted Insect Survey has been monitoring moth populations at certain locations). Interest in moths is growing rapidly, but greater co-ordination is required to turn important local knowledge into a wider understanding and a force for positive conservation at local, national and international levels. The enthusiasm and expertise of moth recorders will be vital to the success of the NMRS. The project has been built upon the views and concerns of moth recorders, gathered during the consultation and planning phase, and discussion and feedback will continue as the Scheme takes shape.

Since there is already a huge amount of moth recording taking place, promoted by local groups, the new scheme should work with that effort, harnessing additional useful information from moth records, with minimum extra work for recorders. Thus, the Scheme will be developed around the existing system of County Moth Recorders, who already fulfil vitally important roles of collating, verifying and, in many cases, computerising moth records. The project team will work to support moth recorders, local groups and County Moth Recorders to ensure that there is a viable network across the UK, Isle of Man and Channel Islands. The creation of a national recording scheme will encourage all moth recorders to submit their records, via their County Moth Recorder, to a central database of moth distribution records. This central (UK) database will be an additional resource and will not undermine the importance of local data sets of moth records held by County Moth Recorders, local groups or local environmental record centres.

In the future, the aim is to develop online recording as a way of increasing participation, reducing the burden of data input and providing useful tools to moth recorders, as well as helping to ensure that the new recording scheme is sustainable in the long-term.

How will the moth records be used?

The National Moth Recording Scheme database, which will be one of the biggest of its kind in the

world, is only a means to an end. The records will be used to provide feedback, stimulate further recording, extend knowledge of moths and support conservation and research. Distribution records are vital in biodiversity conservation to target protection and management. Moth records can be used to identify species in rapid decline and in need of conservation effort. They can also be used to monitor species that are doing well, as some moths are of course, and provide information about the likely causes of long-term decreases or increases. As all moth populations fluctuate greatly in response to the weather and other factors, many records over many years are needed to ensure that conservation decisions are sound.

The six-spot burnet *Zygaena filipendulae*, a familiar day-flying moth

The central database and other information about moths will be made available to moth recorders and others through a dedicated project web site (www.mothscount.org) and the National Biodiversity Network Gateway. Provisional distribution maps of each moth species will become available online, as more and more data are added, providing rapid, positive feedback to participants, as well as essential information to encourage and guide further recording. In addition to these 'live' maps, we will produce a provisional atlas at the end of the project (both online and as hard copy). A long-term aim, outside the scope of this project, will be to publish an atlas of the larger moths of Britain and Ireland.

Although records, databases, maps and trends are an important part of Moths Count, the project is also very much about people. People record and study moths because it's fun and exciting, and because moths are amazing animals. Although moth recording is more popular now than it has probably ever been in over 300 years of amateur study[5], the public perception of moths is generally negative. Most people like butterflies and dislike moths. If they see a brightly coloured, beautiful moth they assume it is a butterfly, particularly if it is one of hundreds of moth species that are active during the day. Politicians and policy makers are no different. If we want to conserve moths then we must challenge the public misconception of them as dull, brown, jumper-chomping pests!

Feedback and useful information for moth recorders is an integral part of the project. In addition to provisional maps, information about the project and about moths will be disseminated via a wide range of publications and media coverage, as well as face-to-face meetings. National conferences are being held to offer moth recorders a chance to hear more about the project and input their own ideas. A successful meeting was held in February 2007 as part of Butterfly Conservation Wales Volunteer Seminar and many active recorders took the opportunity to contribute their own ideas.

How can I get involved?

Moths Count is also organising free training workshops and public moth events for new and existing moth recorders. In 2007, ten such events took place in Wales, from Anglesey to Pembrokeshire, many held jointly with the National Trust. Some Moths Count events are aimed at people new to moths, with the aim of recruiting new recorders, but others provide opportunities to learn about rare or scarce species, or to learn new skills. As the project develops, further training opportunities will be provided for existing moth recorders.

We plan to raise awareness of moths and encourage participation in moth recording, sowing the seeds of interest amongst the moth recorders of the future.

Cyfri'r gwyfynod sy'n cyfrif

Gyda 35 biliwn lindys yn cael eu bwyta'n flynyddol ym Mhrydain gan gwion titwod tomos las, pwy all wadu fod gwyfynod yn elfen allweddol o'r bywyd gwyllt sydd o'n cwmpas. Cofnodwyd 2500 math o wyfyn ym Mhrydain, ond er y diddordeb cynyddol ynddynt, mae 'na bryder hefyd am eu dyfodol. Mae prosiect newydd gan gymdeithas Gwarchod Glöynnod Byw yn bwriadu codi ymwybyddiaeth, hybu'r gwaith cofnodi a chreu basdata cenedlaethol anferth. Bydd y wybodaeth a gesglir fel rhan o'r Cynllun Cofnodi Cenedlaethol hwn yn helpu adnabod pa rywogaethau sydd dan fygythiad, a pha fath o weithredu sydd ei angen – boed yn waith ymarferol, ymchwil neu waith polisi. Gan fod poblogaethau'n amrywio o flwyddyn i flwyddyn, rhaid hel llu o gofnodion dros gyfnod hir er mwyn sicrhau bod penderfyniadau cadwraeth yn rhai call. Mae pobl yn rhan allweddol o'r prosiect. I rai, mae gwyfynod yn rhyfeddol, i eraill maen nhw'n greaduriaid di-nod a di-liw sy'n difetha dillad! Rhaid ceisio hameisio egni a brwdfrydedd ar y naill law a chwalu camargraffiadau ar y llaw arall os am lwyddo gwarchod gwyfynod.

Os hoffech gymryd rhan yn y prosiect hwn ewch i wefan **www.mothscount.org**

Recording events such as National Moth Night (run in partnership with *Atropos*) and the new Garden Moths Count (an online survey aimed at the gardening public) will spearhead this work, while (as mentioned above) scores of public moth events are being planned with organisations such as the RSPB and National Trust. These events will offer people a chance to experience moth recording first hand in the presence of enthusiastic experts. For those who catch (or have already caught) the bug, a programme of training events will provide further opportunities to learn about moths, moth recording and conservation. The many moth trapping events run by Butterfly Conservation Branches, local moth groups and other organisations will also play an important role in helping to sustain the interest and involvement of new recruits. We'll continue to work closely with the media to try to present positive stories about moths too.

The **Moths Count** project is ambitious and challenging. To set up and co-ordinate all these activities requires not only the generous financial support and assistance of partner organisations, but the enthusiasm, help and expert knowledge of moth recorders. Together we will see moth recording and conservation enter a new era, to the great benefit of people and moths alike.

Find out about the project and moth events at **www.mothscount.org** or contact the Moths Count team on **01929 406009**.

Richard Fox and Zoë Randle work for Butterfly Conservation, Manor Yard, East Lulworth, Dorset BH20 5QP. Thanks are also due to Russel Hobson, Senior Conservation Officer, Butterfly Conservation Wales, for help with the text.

Principal funders for the project include the Heritage Lottery Fund, British Entomological and Natural History Society, City Bridge Trust, Countryside Council for Wales, Environment Agency, Environment and Heritage Service, Hampshire Branch of Butterfly Conservation, Natural England, RSPB, Royal Entomological Society and Scottish Natural Heritage. Business partners include Anglian Lepidopterist Supplies, Apollo Books, B & S Entomological Services, British Wildlife, Cell Creative, MapMate and Watkins and Doncaster.

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Dinefwr Park
reserved for the nation

All photographs: Yr Ymddiriedolaeth Genedlaethol / National Trust

Dinefwr is renowned for its ancient trees

There are few places in Wales where the marriage of cultural, historical and environmental values has been so fulfilled as at Dinefwr Park and Castle by Llandeilo in Carmarthenshire. Balancing so many interests can be difficult, but simple solutions often satisfy everyone. ***HELEN BUCKINGHAM, EMMA PLUNKETT-DILLON*** *and* ***BRIAN HANCOCK*** *report.*

Dinefwr Park covers over 338 hectares (811 acres) and consists of rolling ancient grassland and wood-pasture, wetlands and woodlands. Parts of the park are a remnant of medieval woodland, featuring many ancient trees at least 400 years old. And at its core, the wood pasture is dominated by nearly 300 huge oak trees, including some of the oldest and largest trees in the UK - one is thought to be over 700 years old!

The park was in the ownership of the Rice/Rhys family for approximately 500 years until the 1970s. Part was sold for farming and significant pieces of woodland were acquired by The Wildlife Trust South and West Wales. The deer park remained in the ownership of Lord Dynevor until 1987 when it was bought by the National Trust (NT), which went on to acquire the outer park and wet meadows. The house came into Trust ownership in 1990, followed by the East Drive. Home farm was acquired in 2005 and Inner Courtyard in 2006.

The SSSI, covering some 223 ha was originally notified in 1973 and re-notified in 1983 for its old oak trees and their associated epiphytic lichens and specialist wood decay invertebrates. Dinefwr Park's cohort of veteran maiden oaks, a relict, living ancient monument of national importance, provide an ecological continuity of wood-pasture spanning seven centuries. They are the reason why the park is considered second only to the New Forest as a site for such trees.

Newton House

Many sides to the park

Dinefwr is also of exceptional significance for its archaeology, designed landscape and buildings. The present day landscape was set out by George Rice and his wife Cecil with some assistance from Lancelot 'Capability' Brown in the second half of the 18th century. It has been widely admired ever since with impressions recorded by means of painting, sketching and the written word – it even appeared on a dinner plate, part of a service commissioned by Catherine the Great. Today it is widely acknowledged to be one of the finest designed landscapes in the UK. At the centre of this is Newton House. Originally constructed in the 17th century to a simple but elegant design, it was encased in limestone to a Venetian-gothic design in the 1850s. Silhouetted against the southern sky are the ruins of Dinefwr Castle, once occupied by the Lord Rhys, one of the most influential of the Welsh princes.

A new National Nature Reserve

On July 13th 2007 the SSSI part of the site, from the park to the floodplain of the river Tywi, was declared a National Nature Reserve (NNR), the first parkland NNR in Wales. NT welcomes the declaration as a worthy recognition of the many environmental and cultural riches of Dinefwr, providing new challenges for the management of this iconic site.

Dinefwr's ancient trees, important in their own right, are host to a remarkable assemblage of wood decay invertebrates including 400 saproxylic (dead wood) beetle species, 26 of which are Nationally Scarce. More than 160 species of lichen have been recorded in the park, several of which indicate a long history of ecological continuity, and one, *Collema fragrans* is a Red Data Book species.

The site includes the impressive floodplain of the Tywi with its meandering course, and a series of seven oxbow lakes. These are some of the least modified in Wales, supporting a typical range of aquatic and emergent plants. The more unusual species include lesser marshwort *Apium inundatum*, nodding bur marigold *Bidens cernua* and bladderwort *Urticularia australis*. Recent surveys have identified over 117 species of invertebrates in these oxbows. The lakes, river and flood plain grasslands are noted for their wintering wildfowl. From the vantage point of the castle the dynamic nature of this landscape can be appreciated. In our imagination we see an open floodplain landscape with alluvial forest, mosaics of grassland and scrub and open water, and perhaps, in the long term, reintroduced beavers.

There are three blocks of woodland in Dinefwr Park, all owned by the Wildlife Trust of South and West Wales: Castle, Church, and South Lodge Woods. All are structurally diverse with plant communities and invertebrates indicative of ancient woodland. Two hundred species of higher plant have been recorded and 15 species of lichen.

The site is underlain by Ordovician rocks, limestone, shales and sandstones, overlain by glacial drift. The area is of very high geological interest with rock outcrops showing classic exposures, with rich, shelly fauna. The site is of international significance and was awarded Geological Conservation Review status in 1988.

White Park cattle, a rare breed restored to the Park in 1992

The hay meadow in Castle Field proved to be a very successful trial project.

Fallow deer

Increasing biodiversity

Over the past three years the Trust has worked to increase the biodiversity of the outer park and Home Farm, part of our goal of developing a less intensive and more sustainable land use practice for the Park and its buffer lands. There are excessive nutrient levels in the soil surrounding the Home Farm, the result of years of intensive dairy farming. By taking these pastures back in hand and working in partnership with local farmers on short-term grazing licences, and by annual harvesting of hay crops and avoiding the use of inorganic fertilizers, we are trying to restore species-rich hay meadows and other grasslands. The first attempt, in Castle Field, was surprisingly successful.

The Park is well known for its fallow deer and, in particular, its White Park Cattle - a Rare Breed restored to the park in 1992 after a long absence. Both the deer and the cattle are integral to the historic park, in which they maintain a complex mosaic of ancient grassland habitats. While their grazing generally decreases sward height and variability, it does increase plant species richness, cover and flower abundance. This has had beneficial effects on phytophagous (plant eating) invertebrates and those living within flowers. Like many other historic parks, it is likely that much of Dinefwr's grasslands have never or rarely been ploughed and its soils are likely to support a high number of species of fungi. Certainly from mid summer onwards the display of waxcaps can be impressive in the more open and tightly grazed swards.

Archaeological survey has revealed evidence of earlier landscapes, including the defensive structures of an Iron Age fort and, most remarkable of all, two overlapping Roman forts. Faint earthworks mark the outlines of tracks and field boundaries that pre-date the construction of the deer park in the middle of the 17th century. However, despite extensive investigation, nothing has been found of the two towns, Dinefwr and Newton, which documentary accounts describe. The park boundaries include two Scheduled Ancient Monuments and 14 listed buildings. The site is a Registered Park and Garden (Grade I) and a Registered Landscape of Outstanding Historical Importance.

Planning the park's future

The NTs conservation plan (2005) sets out our intention to restore the park to its early 19th century appearance. This process includes restoring the original vistas by felling later plantings, the re-planting of native species in accordance with the original design, re-instatement of the original access routes and the restoration of flower-rich swards in the grasslands.

Management of historic parks requires a high level of

Pond and dead tree – both vital habitats for invertebrates

integrated and cross disciplinary work. At Dinefwr the National Trust has met this challenge by defining management policies that ensure that individual components of this complex landscape are not threatened or compromised by others. At the same time we recognise that we have a responsibility to conserve and celebrate the special qualities of this landscape. Dinefwr is a place to be enjoyed by all.

Trees are integral to the appearance and aesthetic qualities of Dinefwr's landscape, so it is in the interest of all to maintain the planting pattern. Other aspects are not so straightforward. Cleverly laid out paths and rides were an essential element of every 18th century park. At particular points along these routes the owners and their guests enjoyed views over the park and also out into the wider landscape over the park walls. These were usually carefully framed with trees and often marked with distinctive species – one of the views at Dinefwr is marked with a plane tree. Restoring these requires negotiation and compromise.

Dead and dying timber on trees and on the ground is a vital habitat for many invertebrates and is important in nutrient recycling. It can enhance or ruin a vista depending on your point of view. In some parts of the park it seems out of place but in others it embellishes the picturesque nature of the design. In most cases, though not all, simple solutions satisfy everyone.

Buildings and walls present a particular challenge. Some, in poor condition, host important flora and fauna. Repairs are planned to accommodate biodiversity - for example the 17th century deer park wall is being patched and stitched rather than rebuilt so that islands of the wall's lower plants, higher plants and invertebrates are maintained.

The Trust will continue to work towards achieving its vision of a robust and healthy site which is rich in biodiversity, enhancing the designed landscape and maintaining its rich suite of historical and cultural features. In the parkland this will ensure that veteran trees are part of the future landscape and that dead and dying timber is a key component of the habitat. The grasslands will all eventually be restored to flower-rich swards. White Park cattle and deer will be part of this process, important in their own right and essential as habitat management tools. The future of the floodplain is an integral part of the vision: though

Sbardun newydd i warchod hen dirlun

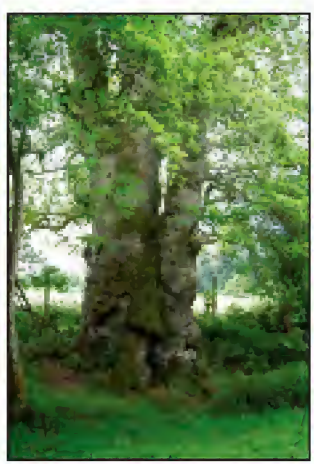
Naws hen sydd ym Mharc Dinefwr. Mae haenau'r gorffennol yn drwch yn y llecyn hwn - caerau'r Oes Haearn a'r Oes Rufeinig, castell a thiroedd canol-oesol a thirlun neilltuol o'r 18fed ganrif. Ond mae'r safle hefyd yn bwysig oherwydd y bywyd gwyllt. Cofnodwyd 400 o chwilod pren marw a 160 math gwahanol o gen ar y coed deri hynafol sy'n tyfu ar y parcdir. Mae presenoldeb y coed hyn yn tystio bod cynefin porfa goediog wedi bod yn bresennol ar y safle ers saith canrif. Islaw'r parc, ac o dan adfail castell Dinefwr, mae afon Tywi'n dolennu'n braf. Mae'r saith ystumllyn wrth ei hymyl ymhlith y mwyaf naturiol yng Nghymru. Cofnodwyd llu o blanhigion ac 117 o greaduriaid di-asgwrn-cefn ynddynt. Mae'r ddaeareg Ordoficaidd hefyd yn bwysig, a'r brigiadau craig yn llawn ffosiliau. Dynodwyd y Parc yn Warchodfa Natur Genedlaethol yn 2007. Un o'r prif amcanion yw adfer cyflwr a chyfoeth y glaswelltiroedd, gyda chymorth y ceirw a'r gwartheg gwyllion traddodiadol. Bwriedir adfer y tirlun hefyd i'r hyn ydoedd ar ddechrau'r 19eg G. Golyga hyn ail-greu golygfeydd, ail-sefydlu llwybrau ac ail-blannu yn ôl y cynlluniau gwreiddiol. Ond ar yr un pryd, rhaid cofio am yr angen i warchod y bywyd gwyllt arbennig sydd i'w ganfod, er enghraifft, yn y coed marw ac yn y waliau sydd angen eu trwsio! Rhaid wrth gydbwyso a thrafod gofalus wrth reoli parciau hanesyddol!

Natural flooding in the Tywi valley

we only own a small part of the valley we hope to be able to demonstrate best practice in floodplain management. The designation of the NNR gives us cause to celebrate this unique site, helping us to focus our efforts and resources and to deliver a truly integrated vision for the future.

Helen Buckingham is Nature Conservation Adviser; Emma Plunkett-Dillon is Historic Properties Adviser; and Brian Hancock is Head Warden, Carmarthenshire, all for the National Trust, Wales.

The National Trust is working with its partners the Wildlife Trust South and West Wales and Cadw (who manage the castle) to implement these policies. Funding from the Heritage Lottery Fund and Wales European Funding Office has enabled us to establish the Dinefwr Project. This aims to improve and enhance biodiversity, restore the designed landscape and improve access for all. Newly refurbished paths enable visitors to enjoy the property including the woodland, the designed landscape, the castle and the flood plain. Leaflets available from the visitor centre highlight key features along each route and explain history, archaeology and ecology. A new exhibition in Newton House which is due to open in March 2008 aims to enthuse visitors and encourage them to explore the park for themselves. We hope that they will come away having had an enjoyable and uplifting experience with some understanding as to why this is one of the most special landscapes in Wales.

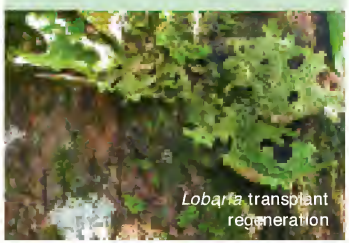


Tree lungwort lichens in mid Wales - the long goodbye?

All photos: Ray Woods

Transplanting lungworts on to bark with nylon mesh

RAY WOODS reports on the gloomy outlook for a charismatic group of lichens, and the chink of light which positive action could provide.



Lobaria transplant regeneration

The heart of any lichenologist cannot fail to miss a beat at the sight of any one of the four species of tree lungwort lichens *Lobaria* spp. that occur in Wales. They are what lapwings and corncrakes are to ornithologists or butterfly orchids to botanists. Grown well, lungwort lichens can reach the size of dinner plates and were once probably the dominant lichens on mature and veteran trees across most of Wales.

As the common tree lungwort *Lobaria pulmonaria* in its convoluted surface looked rather like a lung, it was used to treat lung diseases, which must once have been common in our ill-ventilated, smoke-filled homes. Ironic then that once we had invented the chimney the fate of tree lungwort across most of mid Wales was sealed. It hated the sulphurous flue gases created by burning coal and as industrialisation proceeded in the English Midlands and south Wales the sulphurous

The brown shields are the fruit bodies and produce tiny spores

smoke spread, killing off or severely impairing the reproductive performance of these lichens.

They suffered in a number of ways. Close to the source of pollution the early-oxidised products of coal combustion, notably sulphur trioxide, were highly toxic. At a distance sulphur and nitrogen oxides were converted into tiny droplets of sulphuric and nitric acid. The droplets settled on trunks and branches or were washed out by snow and rain and acidified the tree bark. Unfortunately tree lungwort lichens all avoid the most acidic of bark and seem to require basic bark (more alkaline than acid) to grow well.

They were fortunately still able to find some basic bark in sheltered north to south-running ravine woodlands where the worst of the pollution from the east blew over the top. Being long-lived species (colonies have now been observed for over 27 years on a single tree) they have also survived in a few places on veteran trees whose bark is naturally more basic than on younger trees, and whose enormous overhanging branches shelter the trunks from some of the acidified rain.

The common tree lungwort reproduces in a number of ways. A single, large, plate-like colony can grow outwards as the centre dies to form a number of new colonies. This lichen can also form small, brittle lobes that easily break off in the wind or could be spread by animals as diverse as birds or mites. Both the alga and the fungus that make up the lichen travel together by these vegetative reproductive methods.

Alternatively the fungus can reproduce alone by producing spores from brown shield-shaped structures that form on the lobes. The spores must take their chance of alighting close to the right alga to reform the lichen. These fruit bodies never seem to form any more in almost all of the mid Wales populations. Specimens collected before the industrial revolution were wonderfully fertile. The reasons for this change are unknown. Existing pollution levels may be debilitating. It is more likely that populations are now so fragmented that the right mating strains never meet. Unfortunately next to nothing is known of the sexual proclivities of lichens.

Within Brecknock and Radnor since 1978 only 23 trees with the common tree lungwort have been found. Within the last 29 years 11 of those trees have either been felled (2), partially or completely collapsed (5) or lost their tree lungwort for known (1) or unknown reasons (3). Only twice what appears to be recent colonisation of new trees has been seen, and then only close to existing colonies. Nowhere can it be found on adjacent trees. All colonies appear now to be isolated and relict.

Recent work in Europe where these lichens are just as threatened has suggested that in native spruce forest, after calculating all the risk factors, only sites with more than 15 colonised trees have any long term future. Spruce probably has a similar life span to ash and whilst oak may live longer it may only be suitable for colonisation by lungwort late in life. So left to their own devices no sites in mid Wales appear to be viable for the commonest lungwort species. With just one tree supporting *L. amplissima* and *L. virens* these species have little future. The race is now on to try and identify those few sites in Wales where long term viability for lungwort seems likely and ensure their importance is recognised and to find ways of assisting their survival in other sites.

Fortunately it is possible to transplant lichens such as lungwort. The tiny vegetative propagules called isidia can be trapped in surgical gauze and stapled to new trees. With growth of about half a millimetre in 5 years and a tasty item in the diet of tree slugs, success by this most natural of methods is not that certain. Whole lobes can be successfully trapped against new trees using nylon net. This technique has now been employed in a few sites in Wales and recently for the first time a transplant on an ash tree in Ceredigion appears to have successfully propagated itself, with new colonies being founded above and below it on the tree. This form of intervention may not suit the purists; but as it is our activities - pollution, the fragmentation of woodlands and the destruction of ancient trees - that have brought about this demise, surely it is worth this extra effort to conserve this most emblematic group of lichens?

Ray Woods is Plantlife's Lower Plants champion.

Central grey colony *L. amplissima* surrounded by flat green lobes of *Lobaria virens*, and larger lobes of *L. pulmonaria*

Anadl olaf llysiau'r ysgyfaint?

Roedd twf diwydiannol De Cymru a Chanolbarth Lloegr yn drychineb i lysiau'r ysgyfaint. I'r cennau hyn, sy'n ddibynnol ar awyr lân a rhisgl basig, ergyd farwol oedd y gronynnau sylffwraidd a'r diferion glaw asid a grewyd gan fwg a nwyon y gweithfeydd.

Ers 1978, cofnodwyd llysiau'r ysgyfaint yn tyfu ar 23 coeden yn unig yn Sir Faesyfed. Bellach, mae'r mwyafrif o'r coed hyn wedi cael eu torri, wedi cwympo drosodd neu wedi colli'r cen am resymau aneglur. Gweddillion ynysedig yw'r planhigion a welwn heddiw. Yn ôl astudiaethau yn Ewrop, rhaid i'r cen fod yn bresennol ar 15 coeden, fan lleiaf, os am sicrhau dyfodol i'r boblogaeth honno. A oes yna safle o'r fath ar ôl yng Nghymru heddiw?

Mae trawsblannu'n cynnig llygedyn o obaith. Yn ddiweddar, mae darn o lysiau ysgyfaint a drawsblannwyd ar onnen yng Ngheredigion wedi dechrau atgynhyrchu'n llwyddiannus. Bydd rhai'n beirniadu'r fath ymyrraeth, ond gan mai dyn fu'n gyfrifol am dranc y cen hwn oni ddylem nawr fod yn gwneud ymdrech daer i'w warchod?

Eosiaid Gwlad y Gân

Lluniau: ©RSPB Andy Hay

Aderyn sy'n gysylltiedig â thiroedd isel a hinsawdd gyfandirol yw'r eos. Tybed, felly, a fyddai Cymru erioed wedi gallu cynnig cynefin addas i'r aderyn bendigedig hwn? ***DUNCAN BROWN*** *sydd yn holi ac yn chwilio drwy'r dystiolaeth.*

Eos Ceiriog, Eos Morlais, Eos Bradwen; doedd dim prinder Eosiaid yng Ngwlad y Gân. Ond nid dyna brofiad Gerallt Gymro yn 1188 pan soniodd am gasineb Archesgob Caergaint tuag at dywydd Cymru, gan ddweud bod yr eos (yr eos go iawn), yn gallach nag yntau wrth gadw draw! Ac eto, serch hynny, dewis sôn am yr eos a wnaeth Gerallt boed brin neu gyffredin.

Nid yw tras y gair 'eos' yn wybyddus (Thomas 1966). *Eos* yw'r gair Groegaidd am 'gwawr', ond er y cysylltiad gwan gyda chyfnod canu'r aderyn (gyda'r nos ac nid yn arbennig gyda'r wawr y mae'r eos yn canu), ni thybir bod unrhyw gysylltiad etymolegol rhwng y ddau air (Cys. Pers. Foster Evans). Ffurfiau tebyg i *nachtegal* sydd gan ieithoedd Tiwtonaidd amdano: cantor y nos, nid y wawr sylwch. Ond mae ei enw Lladin *luscinia* yn awgrymu mai aderyn ydyw sydd yn datgan dyfodiad y dydd newydd gyda'i gân, ac mae'r enw hefyd yn gytras â hen eiriau Indo-Ewropeaidd am oleuni, geiriau y mae'r enw Lleu yn Y Mabinogi yn un ohonynt. Amrywiad ar *losseignol* (o *luscinia*) yw *rossignol* y Ffrancwyr (Dubois *et al*.). Duwies esgor oedd Luscinia yn ôl bwystawr o'r seithfed ganrif *Issodore Seville*.

Serch absenoldeb honedig yr eos yn oes Gerallt, aeth yr hen Gymry â'u henw unigryw amdano i Lydaw mor gynnar â'r nawfed ganrif – *eostik* ydyw yn y Llydaweg (Thomas 1966). Aderyn bach ydyw yn ôl yr enw hwn - fel y mae afon fach yn *afon-ig*, ac oen bach yn *oenig*. Does fawr o amheuaeth chwaith mai'r cantor nos yr ydym yn ei adnabod heddiw a olygir wrth y gair, a barnu o'r gerdd hynafol di-enw yn y Llydaweg *Ann Eostik* (Gibson *et al.*):

Eunn eostik bep noz a glevann;
Ken ge e kan, ken dous e kan
(Yr eos a glywaf pob nos/Mor hapus a swynol ei gân)

Mae Llyfr Taliesin yn cyfeirio ato yn y 13eg ganrif, yng nghwmni cogau mis Mai. A chyfeirio at greadur byw yn ei gynefin, ac nid at sentiment y traddodiad perganu, a wnaeth Dafydd ap Gwilym: *Cytgerdd eos mewn coetgae* meddai, ac eto, *Salm wiw is helm o wiail*. Roedd Dafydd felly yn hollol ymwybodol o gynefin yr eos, fel yr oedd John Keats yn ei *Ode to a Nightingale* chwe chanrif yn ddiweddarach:

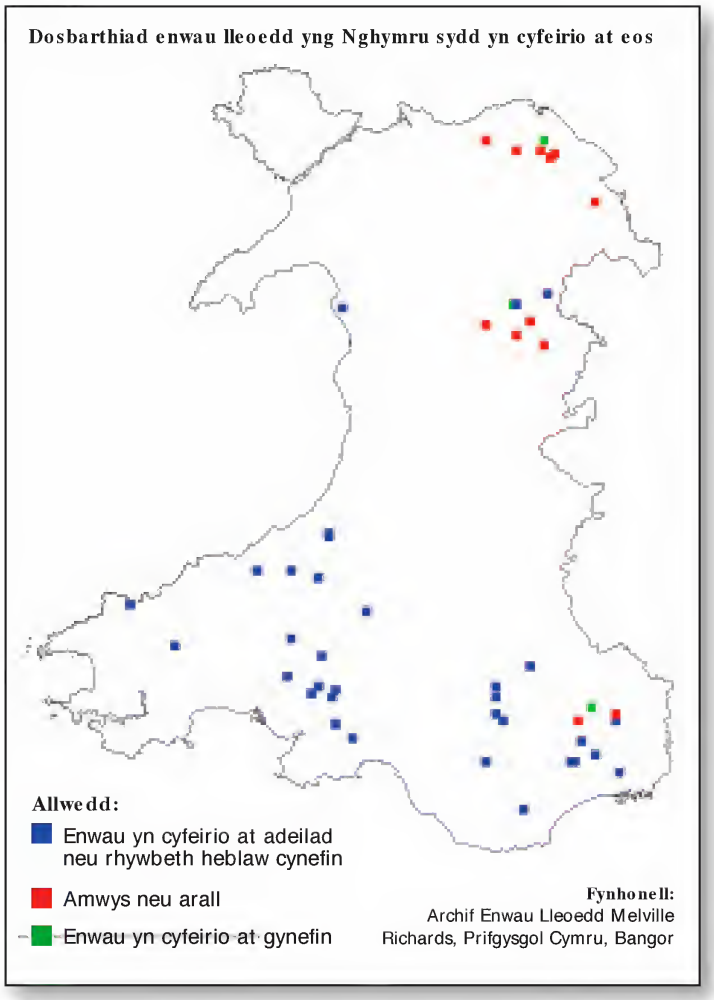
Adieu! adieu! thy plaintive anthem fades
Past the near meadows, over the still stream,
Up the hill-side; and now 'tis buried deep
In the next valley-glades

...But here there is no light,
Save what from heaven is with the breezes blown
Through verdurous glooms and winding mossy ways.

Yr hyn sydd yn gwneud cerdd Keats yn arbennig yw ei allu i gyfleu cân yr aderyn yn sigl y geiriau – nodwedd na chafodd ei gwir werthfawrogi gan academwyr y Tyrau Ifori! Cyfeiriodd William Salesbury (1547) ato *fel ederyn a gan y nos, a nyghtyngale* (Thomas 1966).

A oedd hinsawdd a thirwedd Cymru yn y cyfnod ôl-Rufeinig yn fwy addas i eosiaid nag y bu fyth wedyn? Dyna'r Cyfnod Cynnes Canoloesol, cyfnod o fwynder pan fu gwinllannoedd Prydain yn eu gogoniant a phobl y gorllewin yn mwynhau tywydd Mediterranaidd a phan fu'r Northmyn yn gwladychu

Ffigwr 1



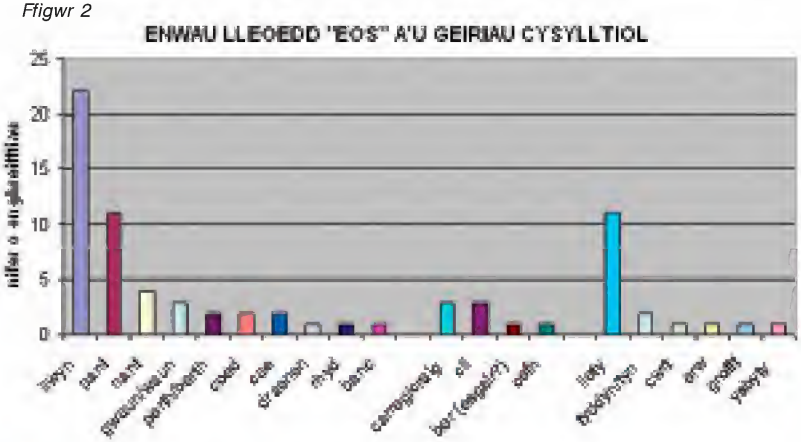
ynysoedd y Gogledd am y tro cyntaf. Ai dyma pryd y gwelodd eosiaid Cymru eu Paradwys olaf? Dengys y ffynonellau na allai'r aderyn hwn fod yn gwbl anghyfarwydd, ar adegau o leiaf, yng nghyfnod bore yr iaith Gymraeg.

Ond a yw'r eos i fod yma o gwbl? Aderyn y parthau deheuol, yr iseldir a hafau hirfelyn cyfandirol Ewrop ydyw. Prin iawn ydoedd yng Nghymru yn ystod y ddwy ganrif ddiwethaf o leiaf ac onid cyrion ei diriogaeth, ar y gorau, y bu Cymru iddo erioed? Nid yw wedi nythu yma ers 1981 (Lovegrove *et al.*), er gwaethaf y cynhesu hinsawdd a ddaeth i'n rhan dros yr hanner canrif diwethaf . Serch hynny, mae'r eirfa enwau lleoedd "eosaidd" wedi eu gwasgaru ar hyd a lled y wlad, a theg yw gofyn beth yn union oedd eu hystyr (Richards *et al.*).

Gwelwn yn **Ffigwr 1** mai 'Llwyn Eos' a 'Pant Eos' yw'r enwau mwyaf cyffredin yng Nghymru o blith yr enwau 'cynefin', a gellir felly yn hawdd credu eu bod yn cyfeirio at yr aderyn go iawn. Ar y llaw arall 'Llety'r Eos' yw'r ffurf fwyaf cyffredin ymhlith y rhai sydd yn fwy tebygol o gyfeirio at lysenw perchen a ganai'n dda, neu at gyrchfan Y Perganu.

Dengys **Ffigwr 2** fod y cofnodion yn ymrannu i ddau glwstwr, yn rhanbarthol ac o ran ystyr. Mae'r rhai 'cynefin' yn lledaenu ar hyd y Deheubarth yn bennaf, a'r rhai 'anheddol' ar hyd

Ffigwr 2



Gororau'r gogledd yn bennaf. Blwyddyn ganolig cofnodi enwau'r categori cyntaf yw 1709 (ystod 579-1839) ac yn achos yr ail, 1733 (ystod 1629-1838). Nid ydynt felly yn ymddangos yn ymrannu'n sylweddol o ran cyfnod.

Dyma gofnododd Charles James Apperley 6 am yr eos, yn ei hunangofiant, tua diwedd y ddeunawfed ganrif:

It is generally supposed that the nightingale is not found north of or far beyond the river Trent. It happened, however, in one year, that one was to be heard in Erthig wood for about six weeks. Being really a rara avis in that part of the world, half Wrexham would be in the wood until a late hour of the night, and some throughout the entire of it. Several unpropitious matches, as well as considerable augmentation of the population to be provided for from the parish rates, were the result of "the amorous power of his soft lay".

Cefais ambell i gofnod tebyg (heb fod mor awgrymog!) o'r un ardal yn ein hoes ni – arwydd fod y Gororau yn cynnig lloches digonol ambell waith i'r eos, yn ogystal ag i Gantorion o Fri. Ond yn hytrach nag ail-bobi gwaith mwy cyfarwydd ar yr eos yng Nghymru mi adawaf y darllennydd i droi at ffynonellau mwy cydnabyddedig (er enghraiift Richards *et al.*) i gael mesur o'i statws diweddar yma.

*Mae **DUNCAN BROWN** yn naturiaethwr sy'n gweithio ar ei liwt ei hun. Mae'n cyfrannu'n helaeth at ymchwil amgylcheddol ac at brosiectau sy'n ymdrin ag agweddau diwylliannol a hanesyddol ar berthynas pobl â'u hamgylchedd naturiol.*

Diolchiadau

Diolch i'r Doethuriaid Dylan Foster Evans o Brifysgol Caerdydd a Rhisiart Hincks o Brifysgol Aberystwyth am awgrymu ambell ffynhonnell a chynnig ambell arweiniad wrth gasglu deunydd ar gyfer y gwaith yma. Diolch i Roy Tapping am baratoi'r map.

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The nightingale – an uncertain presence?

As a bird of lowlands and southern climates, could the nightingale ever have been truly at home here in Wales? The origin of the Welsh name for the nightingale, *'eos'* is unknown. And yet the name was taken from Wales to Brittany as early as the ninth century, where it became *'eostik'*. Sources indicate that nightingales could not have been a completely unfamiliar bird in the earliest days of the Welsh language. In the 13th century the Book of Taliesin refers to the 'eos' and the bard Dafydd ap Gwilym was clearly familiar with the nightingale's habitat. Was Wales' climate and landscape more favourable to nightingales in the warmer post-Roman and early mediaeval period?

It is difficult to imagine Wales as being anything other than marginal territory for nightingales. The breeding records, from the north-east borders, are sparse and nightingales have not nested here since 1981, despite our recent changing climate. And yet place names that bear the word 'eos' are scattered across Wales. Some of these, with a predominantly southern distribution, suggest an associated habitat – for example 'Llwyn Eos' (nightingale bush) or 'Pant Eos' (nightingale valley). Others, such as 'Llety'r Eos' (home of the nightingale) perhaps indicate a dwelling occupied by a person with a fine voice. These names are mostly confined to north-east Wales.

Tufted Saxifrage in Cwm Idwal

survivor of our glaciated past

David Parker

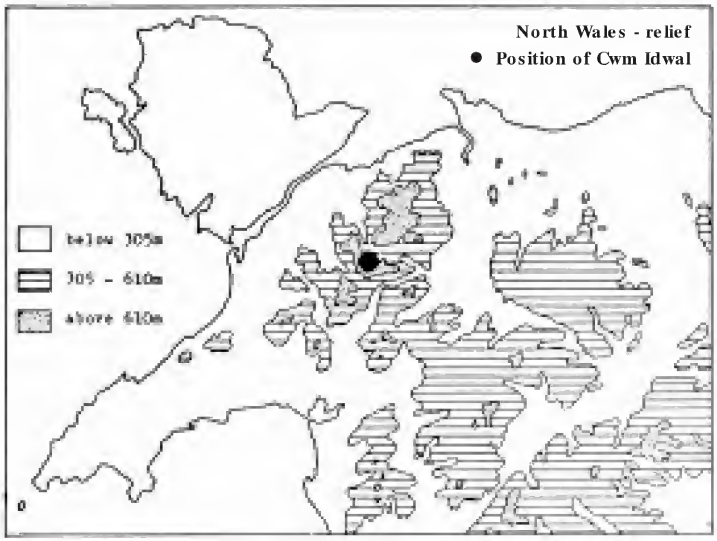
Saxifraga cespitosa in flower

Botanists collecting specimens may have pushed one critically endangered plant to the edge. Three decades ago, rather than see this iconic saxifrage of the high arctic disappear from Wales, a bold experiment was conducted to reinforce the tiny population. Subsequent monitoring has yielded a wealth of information, and a measure of encouragement, as ***DAVID PARKER*** *explains.*

On my first visit to Cwm Idwal, in October 1977, the Warden of the National Nature Reserve, Iorrie Ellis-Williams, showed me the four remaining plants of tufted saxifrage *Saxifraga cespitosa* left in Wales. They were on a small moss-covered ledge, some 12 cm across, and each plant was a small rosette, only 1cm in diameter, diminutive and in poor condition. I was told that the nearest tufted saxifrage plants to these were on Ben Nevis, some 400km away, so these four Welsh plants were the most extreme example of an isolated population I had ever seen.

Tufted Saxifrage in Cwm Idwal

Tufted saxifrage is a real glacial survivor in Cwm Idwal. It is a common plant of the high arctic, found in rocky places, particularly on the debris left behind by glaciers and ice sheets. Pollen records in peat areas taken from Cwm Idwal and elsewhere show tufted saxifrage to have been a common plant in the UK at the end of the ice age, some 10,000 years ago. At this time onwards, glaciers were retreating and leaving behind



rocky debris on which it could thrive, together with other 'arctic-alpine' plants. As the climate warmed and succession to woodland took place, tufted saxifrage and its fellow arctic-alpine plants lost living space and became confined to cool, north-facing mountain sites, most especially where they were composed of lime-rich rocks. These conditions occur in the cliffs around Twll Du, the Devil's Kitchen in Cwm Idwal, and on the boulder scree below, composed of large rocks which have fallen from the cliffs.

In historic times, there is reason to believe that tufted saxifrage was more common than today in Cwm Idwal. The oldest herbarium specimens, at the Linnaean Society, were collected by J.W Griffiths and date from 1796, and many further herbarium specimens occur from the 19th century. Plants were collected in the 20th century too, right up to 1973. This collecting of a relatively small population, perhaps accentuated by climate change and a sub-optimal habitat, led to its almost complete extinction by the late 1970s. At this point there were two native sites, one with the four plants already mentioned and the other where the last plant died in 1976, probably due to the drought and high temperatures of that summer.

The restocking programme

The critical condition in the late 1970s led the Nature Conservancy Council (NCC) to work with the University of Liverpool Botanic Gardens, at Ness, Wirral, to consider a project to increase the population of plants in Cwm Idwal through a restocking programme. In 1976 seeds were collected under licence from the four remaining plants and raised in cultivation at Ness. More seed was picked from these plants, kept in isolated conditions to ensure no cross contamination, and then further plants were raised from these. By May 1978, enough plants had been raised to carry out the restocking programme.

The next stage was to choose the sites. Careful note was taken of the conditions at the native sites and published information recorded from the Scottish sites. Six sites were chosen, the main one being on a large boulder in the boulder scree which supported moss-dominated cushions similar to those found at the native site. North and east facing sites were chosen to provide the coolest and most moist conditions, thought to be important to the long-term survival of plants. This included consideration of whether the sites would allow further recruitment of plants from seed.

Four types of plants material were used in the restocking: mature plants (more than one year old), large seedlings (2-3 true leaves), seedlings (at cotyledon stage) and seed. The plants were placed directly in the moss cushions, ensuring that their roots were placed as deeply as possible. No soil was transferred, and both plants and seed were "watered in" using water collected from the Cwm. No further horticultural intervention was undertaken. A total of 260 plants were planted and full details of the restocking process are in Parker (1982).

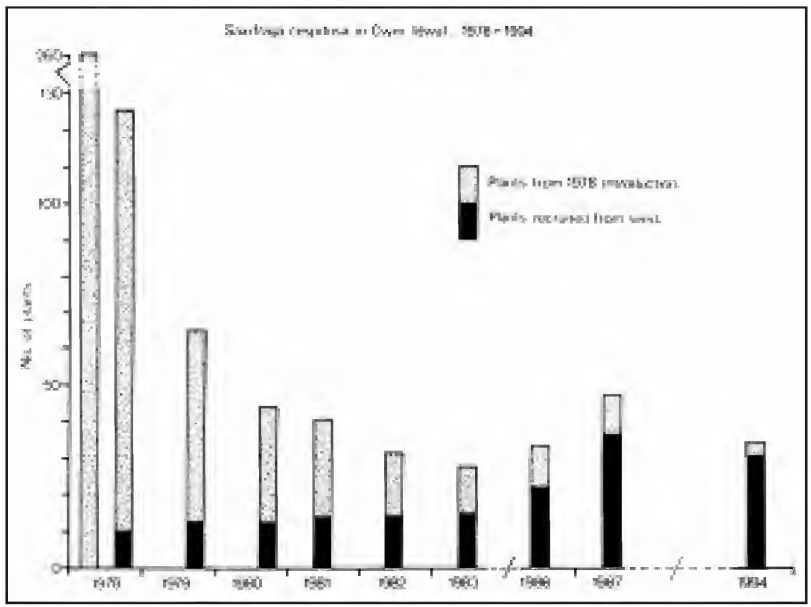
Surveillance, 1978-2007

There was a high mortality of plants in the first season, and it became clear by the autumn which

CCW

Looking down the boulder scree towards Llyn Idwal

sites were going to be most important to the success of the restocking. Surprises followed in the spring of 1979, when an excellent germination of seed took place and new plants established during the year. The 260 plants quickly fell to 125 plants by the autumn of 1978 and to 64 plants in the summer of 1979. The greatest success was with the mature plants, followed by sown seed and large seedlings; there was no survival of small seedlings.



The number of plants then ranged between 24 and 45 plants from 1980-1994, with four to nine plants on the active native site. There was then a worrying loss of all native plants in 1997 and an accompanying reduction on the one remaining restocking site to nine plants. There was a recovery from 1998-2001 followed by a further decline. There has been an encouraging rise in the number of native and restocked plants to 2007 and we are now back at 1998-2001 levels.

I continued to check the second native site, located on a boulder lower down the boulder scree and was rewarded in 1994 when I found seedlings which developed into plants which set seed. With the exception of 1997, a small group of plants have remained on this site to the present day. It is interesting that the last seed to be produced on this site was in 1975/76 which means that the seedlings which germinated in 1994 were from seed which was at least 18 years old. Tufted saxifrage seeds require light to germinate (Parker, 1982) and it appears that seeds are somehow brought to the surface of the moss cushions, perhaps by frost action, rain or insect activity.

Information has also been recorded over this period on the size of plants, their health and number of fruit capsules that have set seed. These data show that plants can grow from seed to a plant capable of flowering in less than a year: a seed germinating in April can reach this stage by July/August in good growing conditions. Plants are extremely drought tolerant and respond quickly to moist conditions

when they resume growth. The most dangerous stage for a plant is in its first winter, when frost can act to lift plants out of their supporting moss cushion: seedlings and small plants are most prone to this. Plants can also be long-lived with many plants reaching 10-15 years old recorded during the 30 years of this study.

The future of tufted saxifrage in Cwm Idwal

There has been much speculation about the future of arctic-alpine plants given current concerns about climate change. It is possible that the low population of tufted saxifrage in Cwm Idwal by 1977 was, in part, a result of climate change. However, I believe that there is enough evidence to suggest that past collecting of an already rare species was enough to reduce its population to near extinction. The surveillance of tufted saxifrage in Cwm Idwal does suggest a remarkable capacity for small populations of the plant to persist and recover from seed sources. The current position is that the native sites' population of 8 plants is matched by the 7 plants on the single remaining restocking site: this position has been largely maintained for the last 10 years. Both the native sites (one from 1994 only) and the restocked site have maintained populations of plants over the 30-year period of the study, albeit that the restocked populations have halved in size from 1980s levels.

Conolly & Dahl (1970) examined the current distribution of arctic-alpine plants against climate conditions and concluded that the distribution of tufted saxifrage, in common with other arctic alpine species, is limited by maximum summer temperatures. This is interesting when set against climate change predictions of higher mean temperatures which have a component of higher maximum temperatures, such as in August 2003 when UK records were broken. Tufted saxifrage survived this event, but it is possible that it will become extinct in Cwm Idwal in due course as temperatures rise.

However, some buried seed in a cushion of moss is likely to remain, brought to the surface after many years, the light stimulating it to germinate, to set off another small population of the plant. Given the evidence from the 30-year study, I suspect that this could go on for some time and, if I'm right, Wales' rarest glacial survivor will hang on and continue to delight naturalists for years to come.

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Y tormaen siobynnog yn dal ei afael

Ar ddiwedd yr Oes Iâ ddiwethaf, tua 10,000 o flynyddoedd yn ôl, roedd y tormaen siobynnog yn blanhigyn cyffredin ym Mhrydain. Roedd wrth ei fodd yn tyfu ar y malurion craig a adawyd gan y rhewlifau. Ond, wrth i'r tymheredd godi, ciliodd i gilfachau uchel, gogleddol, lle'r oedd rhywfaint o galch yn y graig - fel yn Nhwll Du Cwm Idwal.

Yn 1977, ac oherwydd gor-gasglu'n bennaf, dim ond 4 planhigyn oedd ar ôl yng Nghwm Idwal. Roedd y boblogaeth agosaf ar Ben Nevis. Casglwyd hadau o'r pedwar planhigyn er mwyn cryfhau'r boblogaeth Gymreig. Ail-blannwyd 260 planhigyn mewn clustogau mwsogl yng Nghwm Idwal. Er y llanw a'r trai o ran niferoedd, mae'r arbrawf wedi bod yn llwyddiannus, o safbwynt y planhigion cynhenid a'r rhai a ail-blannwyd.

Mae tymheredd yr haf yn dylanwadu'n fawr ar ddosbarthiad y tormaen siobynnog. Yn y pen draw, mae'n debyg y bydd newid hinsawdd yn arwain at ddifodiant y planhigyn hwn yng Nghwm Idwal. Ond, yn y cyfamser, fe fydd hadau'n parhau i godi o ddyfnder y clustogau mwsogl ac yn tyfu i roi gwledd i fotanegwyr am flynyddoedd lawer eto.

Cymru a'r byd

DILLWYN MILES 1916-2007

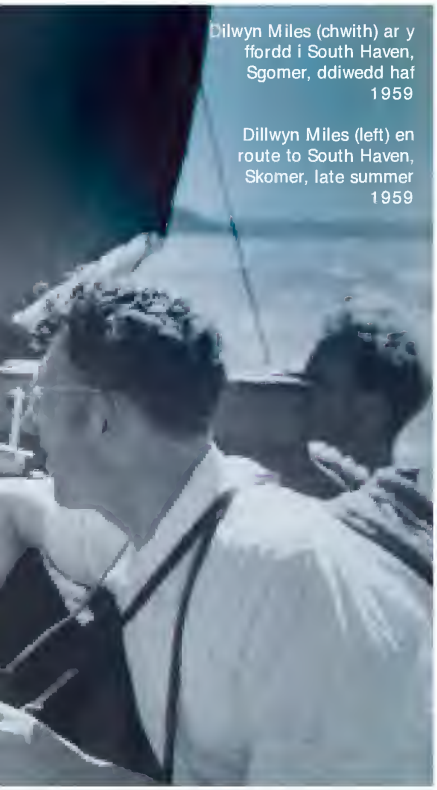
Ar 1 Awst, bu farw Dillwyn Miles yn 91 mlwydd oed. Bu'n ffigwr allweddol yn y cylchgrawn *Nature in Wales*: fel Golygydd Busnes o 1967 ymlaen, ac fel Rheolwr Olygydd o 1971 tan 1979. Yn rhifyn mis Medi'r flwyddyn honno, cyflwynodd hanes cryno o'r cylchgrawn, a dywedodd William Condry yn ei Ddyddiadur Cefn Gwlad yn y *Guardian* ei fod bob amser "yn llawn canmoliaeth am bob agwedd ar gadwraeth a bywyd gwyllt Cymru."

Fe wnes i gyfarfod â Dillwyn Miles y tro cyntaf yn 1959 ar ôl i mi gyrraedd Hwlffordd i gael cyfweliad am swydd newydd sbon fel Warden Preswyl Ynys Sgomer. Am saith mlynedd wedi hynny ef, ynghyd â Ronald Lockley, oedd fy nghyswllt ar y tir mawr. Yn sgîl hyn, bu'n delio efo pob math o bethau - gan gynnwys dyfodiad ein gafr i orsaf drenau Hwlffordd a sicrhau bod llond lle o gyflenwadau angenrheidiol yn cyrraedd yr ynys. Un tro, fe syrthiodd i'r dŵr wrth geisio dod i'r lan yn South Haven – oherwydd, yr adeg honno, doedd teithio mewn cychod ddim yn cael ei drefnu'n hynod o dda. Tra bu fy ngwraig yn ceisio sychu ei ddillad, fe gerddodd ar hyd yr ynys wedi ei lapio mewn tywel bath mawr gwyrdd. Yn wir, roedd yn debyg iawn i ymerawdwr urddasol!

Yn 1967, cymerodd yr awenau wrth sefydlu Cymdeithas Ymddiriedolaethau Gwarchod Natur Cymru, ac ef oedd Is-lywydd Ymddiriedolaeth Natur Gorllewin Cymru. Fodd bynnag, roedd yr hyn a gynigiai Dillwyn i Gymru, ac yn arbennig i Sir Benfro, yn ymestyn ymhell y tu hwnt i'w waith gyda'r Ymddiriedolaethau Natur. Mae'r rhestr yn rhy faith i'w chynnwys yn y fan yma, ond digon yw dweud ei fod wedi bod yn aelod o Bwyllgor Parc Cenedlaethol Sir Benfro ac wedi bod yn Faer Casnewydd ddim llai na phedair gwaith. Hefyd, bu'n aelod o Orsedd y Beirdd Eisteddfod Genedlaethol Cymru am hanner can mlynedd, gan wasanaethu fel Ceidwad y Cledd ac yna fel Arwyddfardd.

Bu'n ddarlledwr ac yn awdur toreithiog – bu'n golygu *The Pembrokeshire Historian* am bron i ddeng mlynedd ar hugain, ac mae ei lyfrau'n cynnwys arweinlyfrau'n sôn am Barc Cenedlaethol Arfordir Penfro a fersiwn odidog o *Description of Pembrokeshire* gan George Owen. Bu farw ei wraig, Joyce, yn 1976. Mae'n gadael mab a merch, ynghyd â Judith, ei bartner ers tair blynedd ar hugain.

David Saunders



Dilwyn Miles (chwith) ar y ffordd i South Haven, Sgomer, ddiwedd haf 1959

Dilwyn Miles (left) en route to South Haven, Skomer, late summer 1959

DILLWYN MILES 1916-2007

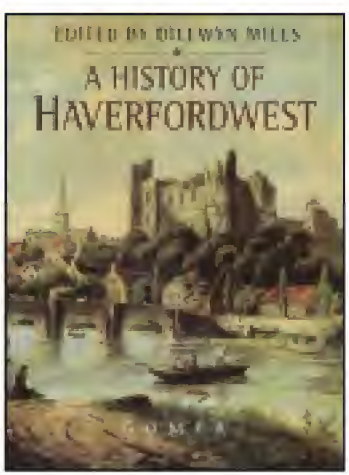
Dillwyn Miles, who died aged 91 on 1 August, was a key figure with regard to the journal *Nature in Wales*, from 1967 as Business Editor, and from 1971 until 1979 as Managing Editor. In the September edition of that year he provided a succinct history of the journal, which William Condry in his Country Diary in *The Guardian* said was "always full of good things about all aspects of Welsh wildlife and conservation."

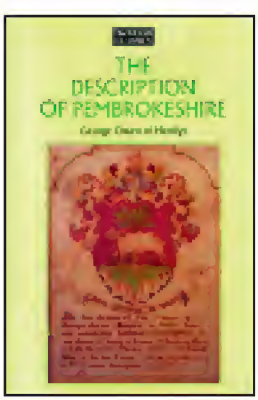
I first met Dillwyn Miles in 1959 when I arrived in Haverfordwest to be interviewed for the newly created post of Resident Warden for Skomer Island. For the next seven years he was, together with Ronald Lockley, my mainland link. As such he dealt with everything from the arrival of our goat at Haverfordwest railway station to ensuring a multitude of supplies and necessities were brought to the island. On one occasion – for boating was not so well organised as later – he fell in while landing in South Haven. While my wife endeavoured to dry his clothes, he walked the island swathed in a large green bath towel. His figure was such that he took on the air of a noble emperor!

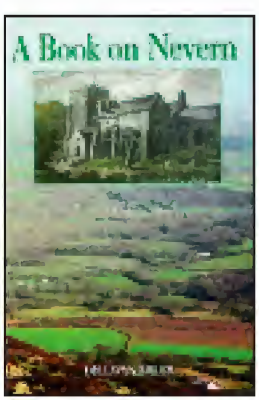
In 1967 he took the lead in the founding of the Association of Trusts for Nature Conservation in Wales, and was a Vice President of the West Wales Wildlife Trust. However, Dillwyn's services to Wales and especially Pembrokeshire ranged far beyond his work with the Wildlife Trusts, and are too numerous to detail here, but included service on the Pembrokeshire National Park Committee and being Mayor of Newport no fewer than four times. He was a member of the Gorsedd of Bards of the National Eisteddfod for more than 50 years and was both Grand Swordbearer then Herald Bard.

A prolific author and broadcaster, he edited *The Pembrokeshire Historian* for almost thirty years. His books included guides to the Pembrokeshire Coast National Park and a splendid version of George Owen's *Description of Pembrokeshire*. His wife Joyce died in 1976; he is survived by a son and daughter, and by Judith, his partner of twenty-three years.

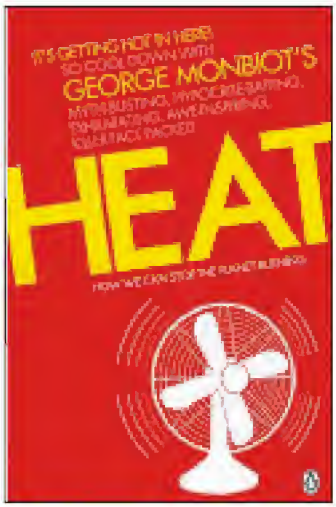
David Saunders







Green **Bookshelf**



HEAT - HOW WE CAN STOP THE PLANET BURNING

George Monbiot

Penguin 2007

£8.99 Paperback

The 19th century evolutionist TH Huxley - nicknamed 'Darwin's Bulldog' - once said that we should "... sit down before truth as a little child: be prepared to discard all preconceptions".

He was talking about the fossil record, but he could just as easily be commenting on George Monbiot's *Heat*. In 270 carefully referenced pages (nearly a fifth of the book consists of endnotes) he sets out how we can reduce our CO_2 emissions as a nation by 90%, without damaging our standard of living beyond repair.

It's a tall order, but Monbiot manages it, by looking across all sectors of society, from energy, travel, shopping and even cement production, to see how each could contribute its 90%.

In doing this, he sidesteps the sterile arguments that plague newspaper letters columns and blogs: nuclear versus wind; roof insulation versus standby buttons; planes, trains or automobiles?

The real revelation in the book for me was the delightfully named Khazoom-Brookes Postulate. What happens when the amount of oil required in widget production is cut by half? The energy is saved, isn't it? Actually, the most likely response is that twice as many widgets will be made instead, and because the price per widget falls, demand may actually increase.

This is the Khazoom-Brookes Postulate: that increased energy efficiency, in the absence of any other restraint on consumption, actually leads to more fuel being used, not less. Monbiot's response to this is a carbon rationing system, based on fossil fuels and electricity, to turn energy efficiency into real CO_2 savings.

Monbiot is to be commended for the level way he discusses both nuclear energy and renewables. He avoids a knee-jerk criticism of nuclear, and is quite honest about the potential carbon reductions it could yield, even though he eventually rejects the technology for other reasons.

And he refuses to get dewy-eyed about how much energy renewables could really deliver. We cannot run our entire economy on them, and will need other technologies, such as carbon sequestration, to see us through. Neither does he shy away from inconvenient truths. We will have to greatly reduce the amount of flying we do. There is no other way.

The only chapter that will date the book in future years will be that on climate change denial. By then, this will seem as odd as thinking tobacco doesn't cause lung cancer, or that HIV doesn't cause AIDS. But, for now, this nonsense still has to be addressed, and you can't blame Monbiot for doing so. I've often longed to take a swing at David Bellamy, Peter Hitchens and Melanie Philips myself.

But could it be done? Not without problems, but the programme Monbiot sets out is a practical one, and relies on technologies that are available now. Will it be done? Almost certainly no. Not because the government is wedded to more road building and expanding aviation, or because oil companies will seek to obfuscate and deny the evidence, although they are, and they do. It will fail because of you and me.

As Monbiot puts it at the end of the preface, "If the biosphere is wrecked, it will be done by well-meaning cosmopolitan people who accept the case for cutting emissions, but won't change by one iota the way in which they live".

So, make a difference. George Monbiot's *Heat* is to be highly recommended. Go out and buy it, change the way you live, and then hand the book on to a friend.

Andrew Lucas

Silff Lyfrau Amgylcheddol

EMPTY PLATES TOMORROW?
Patricia Dodd Racher
Trafford Publishing 2007
£9.95 Paperback

When *Empty Plates Tomorrow?* was published, it received some interested comment in the Welsh press, including praise from the President of the Farmers' Union of Wales. Patricia Dodd Racher is, apparently, a member of Dinefwr Green Group. The FUW agreeing with a green activist? We are living in strange times indeed.

The main thrust of this book is that a peak in oil production would have serious, not to say catastrophic, consequences for food production. It is a path that has been well trodden. For instance, the subject has been discussed at length in Richard Heinberg's *The Party's Over* and Jim Kunstler's *The Long Emergency*, amongst others. The difference is that *Empty Plates Tomorrow?* tackles the subject from a British perspective.

The main problem is that there is no discussion of issues around oil production itself. The concept of a peak, and its consequences, is simply taken as a given. I wondered how someone with no knowledge of the subject would follow the argument. Unlike climate change, the idea of 'Peak Oil' has scarcely penetrated the consciousness of many people with an interest in the environment. Also, unlike climate change, there is no consensus. Dates for a peak vary from 2005 through to 2030. Oil production has been on something of a plateau since 2006, but it is not clear whether this really is the peak, or whether it is a prelude to yet another upward surge in production.

There are interesting chapters, particularly on the state of modern British farming and our ability, or rather lack of it, to feed ourselves. As other authors have done before her, Racher uses Cuba as an example of how a country can react to a peak oil event, albeit an artificial one in Cuba's case. There is a fascinating discussion on how agriculture has adapted, particularly in urban areas. However, the book does leave rational argument behind in the case of 'magnetised water', which is used in Cuba because it allegedly raises yields. According to Racher, it must work, because Cuban farmers wouldn't use it if it didn't. By this reasoning, so do astrology and crystals. What is it with green politics and quack science?

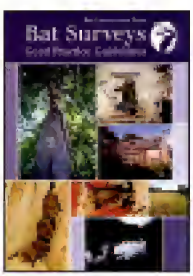
Racher regards renewable energy as the way to go, but the discussion needed a little more thought. She is negative about wind power, telling us that it cannot supply all our energy needs. But then nobody has ever said it could. On the other hand, she approves of tidal barrages across the Severn and Mersey, yet there is no mention of the likely impacts on internationally important habitats and bird populations that these estuaries support.

The book would have benefited from tighter production values at the publisher; many of the figures are reproduced so poorly that it can be quite hard to interpret them. However, *Empty Plates Tomorrow?* is an interesting contribution to the Peak Oil debate, although if you were new to the subject, I would recommend trying one of the better-known introductions to the subject first.

Racher's vision of Wales in 2050 is of a society forced to live a much more hand-to-mouth existence, subsisting for the most part on locally grown produce. In such a climate, our SSSIs, SACs and Biodiversity Action Plans will seem an absurd indulgence. For instance, SACs can only be damaged for reasons of 'overriding public interest'.

What price nature conservation, when the overriding public interest is 'we're starving'?

Andrew Lucas



BAT SURVEYS - GOOD PRACTICE GUIDELINES

The Bat Conservation Trust has just published comprehensive guidance for anyone undertaking bat surveys. The 82 page document will also be useful to ecologists, conservationists, developers and planners.
Contact **enquiries@bats.org.uk** or see **www.bats.org.uk**

Behind Closed Doors:

Door snails are some of the few molluscs we can honestly look up to! Next time you visit a broad-leaved woodland, scan the tree trunks around head height, or higher, and you may well see these small, unusually-shaped snails perched on the bark. Door snails (family Clausiliidae) are named for their unique feature of a 'door' (clausilium) inside the shell that efficiently seals them up in times of crisis. The 'door' is not visible from outside, and is absent in some species, but door snails are still easily recognised by their long, slender shells, which characteristically coil to the left (the opposite to most other land snails).

Wales has five species of door snail. Of these, three are common, one is very rare, and one is newly recognised as a distinct species. However, the latter two are almost certainly under-recorded, so there is a chance here for readers to make their own discoveries. Most species climb trees, rock faces or walls and are most easily spotted there, especially when surfaces are moist, but they can also be found in leaf litter. They feed on lichens, and as such are vulnerable to atmospheric pollution by nitrates and sulphates. This may explain their rarity in large towns, but another threat in urban parks is the tidying away of leaf litter around large trees. The following notes and pictures should allow readers to identify all the Welsh species. Juvenile door snails, whose incomplete shells lack the lip around the opening, are more difficult - unless you are lucky enough to see them being 'laid' by the live-bearing adults!

B.Rowson/NMW

1. *C. bidentata* 2. *C. laminata* 3. *M. rolphii*

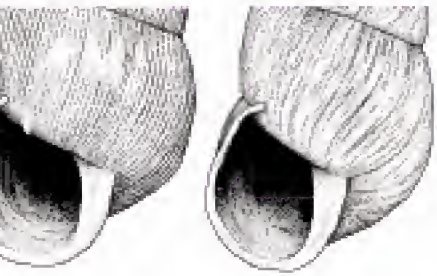
1. ***Clausilia bidentata***
Common Door Snail / Malwoden Ddrws Cyffredin
The commonest species, in scrub and woodland, quarries and on sea cliffs and turf in western counties. Brown, strongly wrinkled shells (9-12mm long) often fade to grey; when dry, they blend in well with tree bark.

2. ***Cochlodina laminata***
Plaited Door Snail / Malwoden Ddrws Pleth
More local than *C. bidentata*, and usually in lower numbers, in woodland and quarries. Shells large (14-17mm), smooth and glossy, with an oblique ridge or 'plait' across the opening.

3. ***Macrogastra rolphii***
Rolph's Door Snail / Malwoden Ddrws Rolph
Unlike other British species, this does not climb trees or other surfaces. Found in leaf litter or in rank herbage, mainly on

Clausiliid snails in Wales

4. *B. perversa* 5. *B. heydeni*



calcareous soils. In Wales, known only from the Penarth area in Glamorgan, but may be under-recorded. Shells (12-14mm) strongly ribbed, rather broad.

4. ***Balea perversa***
Tree Snail / Malwoden y Goeden
Rarely found in woods, more commonly on elder, hawthorn or gorse, and in rocky places. Shells (8-12mm) can be hard to distinguish from a) juveniles of other door snails and b) *Balea heydeni* (see below). Juvenile shells of other species can be recognised by careful comparison with the shape and surface of the respective adults.

5. ***Balea heydeni***
Heyden's Tree Snail / Malwoden y Goeden Heyden
Taxonomists have only separated this species from *B. perversa* in the last few years, so any distributional and ecological differences are poorly known. *B. heydeni* may well be the commoner of the two in Wales, however, and might occur on bark in upland areas with few other snails. Compared to *B. perversa*, the shells of *B. heydeni* are usually smaller (5-7mm) and more conical (especially at the apex). *B. heydeni* is often yellowish or greenish, with streaks in the very finely wrinkled and slightly glossy surface. In contrast, *B. perversa* is often duller and browner, with more distinct but still very fine ribs, and sometimes (but not always) has a tiny tooth at the top of the shell opening. Specimens of the two species are currently needed to validate records.

Two further door snail species occur in England, but have never been found in Wales. None of the British species is covered by conservation legislation, but Welsh colonies of *M. rolphii*, given its rarity, ought to be treated with care. In continental Europe, door snails are more diverse, especially towards the Mediterranean, and they occur as far afield as South-east Asia, South America and South Africa. In Britain their usefulness is purely ecological, but much remains to be learnt despite the relative ease with which they could be studied. For example, how do door snails survive the winter? Why do they climb so high? What are their main predators in different habitats? As with so many invertebrates, learning to notice them is only the start.

BEN ROWSON works at the Department of Biodiversity and Systematic Biology, Amgueddfa Cymru/National Museum Wales; ben.rowson@museumwales.ac.uk

Records of snails can be sent to the Recording Scheme of the Conchological Society of Great Britain and Ireland (see **www.conchsoc.org**).

Further reading

Cameron, R. A. D. (illus. G. Riley). 2003. *Keys for the Identification of Land Snails in the British Isles*. Field Studies Council Occasional Publication no. 79, Preston Montford, UK.

Gittenberger, E., Preece, R. C., and Ripken, T. E. J. 2006. *Balea heydeni* von Maltzan, 1881 (Pulmonata: Clausiliidae): an overlooked but widely distributed European species. *Journal of Conchology* **39** (2): 145-151.

Holyoak, D. T. 1978. Effects of atmospheric pollution on the distribution of *Balea perversa* (Linnaeus) (Pulmonata: Clausiliidae) in southern Britain. *Journal of Conchology* **29**: 319-323. [Note: many of the records in this paper actually refer to what is now called *B. heydeni*.]

ANCIENT TREES OF WALES

Ancient or veteran trees have a value far beyond their number. *KATH OWEN* reports on a project to recognise these special trees.

Lin Callard

Beech tree at the Punchbowl, one of the highest beech woodlands in the UK

As the mist rises across the landscape the ancient trees of Wales stand patiently along old drovers' routes and within communities, waiting to be found and given the recognition they deserve.

Ancient trees can be found in hedgerows, woodlands on boundary banks, parklands, and high in the mountain ranges of Wales. Often the gnarled and knotted old trees are passed by and forgotten, with the exception of a minority which have been cared for by our ancestors. This has allowed us to cherish some very important sites in Wales, including Dinefwr Park in south Wales, which has become a National Nature Reserve, (see p. 23-28) and Powis Castle Estate near Welshpool. Wales can be proud of its upland site at the Punchbowl, near Abergavenny, with one of the highest beech woodlands in the UK.

Our ancient trees in Wales are as important as our historic buildings and monuments. While the latter are lucky enough to be protected by organisations such as Cadw, our ancient trees are not. These living monuments, some over 1,000 years, have survived dramatic changes to the landscape. Ancient yews, for instance, provided a meeting place for pagans, and then Christians, surviving two world wars, threats from development, and often sheer neglect. Surely they deserve some protection within this forever changing environment?

Wales has a few well known ancient trees which have attracted international recognition, including the Llangernyw Yew. Standing in the churchyard of St Digain's in Llangernyw, Conwy, this tree is estimated to be 4,000 years old. The Pontfadog Oak, near Chirk, is the largest sessile oak in Wales. It was already old in the 12th century when the Welsh prince Owain Gwynedd rallied his army beside it before defeating Henry II in battle.

Not only are these living monuments a testament to our landscape history but also they provide important homes for some of our rare and endangered wildlife. Research has found that they hold the key to climatic changes which have occurred throughout centuries, locked within their bark. The more information we collect linked to different species the more we can reveal further scientific information about these ancient relics.

The Woodland Trust launched the Ancient Tree Hunt in June this year to allow us to map these ancient monuments throughout the UK. Living in Wales I believe that we still have many national treasures to uncover to add to those which have been discovered already. We need your help to find out how many ancient trees there are in Wales, to help us identify concentrations and to protect them for future generations.

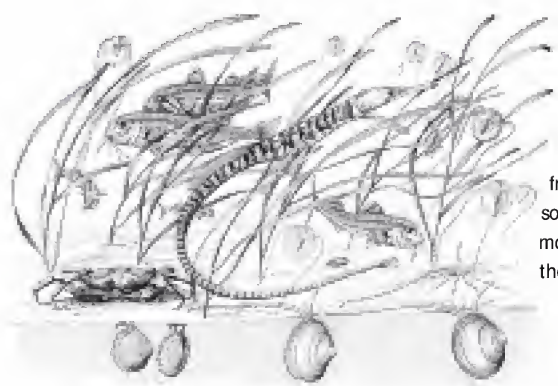
The Ancient Tree Hunt is a five year project led by the Woodland Trust in partnership with the Ancient Tree Forum and the Tree Register of the British Isles. The project is funded by the Heritage Lottery Fund, the Esme Fairbairn Foundation, the Welsh Council for Voluntary Action and Scottish Natural Heritage. For further information on recording an ancient tree please visit **www.ancient-tree-hunt.org.uk** or **www.helfacoedhynafol.org.uk**. Have a look to see if your tree is recorded already, and if it's on the map why not add some photographs or a blog of your visit?

KATH OWEN is Senior Verifier for the Woodland Trust's Ancient Tree Hunt.

Marine matters

In the wet summer of 2007 some Welsh rocky shores looked strangely green. Flushes of green algae are common after the elimination of limpets by oil spills. This time the extra growths of *Ulva* and *Enteromorpha* were living on top of the normal fauna. Was this just a consequence of damp weather or perhaps helped by extra nitrates washed from land?

The shores of Wales were the subject of a recent CCW report *When the tide goes out*, summarising a 10-year study mapping the biodiversity and conservation importance of the whole of intertidal Wales. By systematic surveying beyond shores familiar to naturalists and students since Victorian times, many little known species and groupings were found. One unforeseen find was of seaweeds, normally attached to rocks, living unattached in a few salt marshes. Looking like mop heads, these atypical growth forms were little known except in very sheltered Scottish sea lochs. Though ecologically important, seaweeds now attract less interest than in Victorian times, when collecting them was fashionable. It is no surprise that one red alga was re-found in Tremadog Bay after a 100 year gap.



Given the many modern naturalists out and about in Welsh seas, and with marine spatial planning a key outcome if a Marine Bill is enacted, it is timely to consider the ways 'citizen science' can inform marine conservation. This description has been used for surveys by the British Trust for Ornithology, but could be equally applicable to some marine projects, even if the Victorian enthusiasm for collecting has transmuted into other forms of recording. There is room here to mention only a few of the diverse organisations with volunteers gathering data of conservation relevance.

With a distinctive remit to encourage sports divers to record underwater habitats and species, *Seasearch* is a prime example of the value of volunteer observations. It is organised around three groups in Wales. In the south they help survey and monitor features that include the North Haven bed of sea grass *Zostera marina* at Skomer. The mid Wales group did a detailed benthic habitat survey of a pass through Sarn Cynfelin, and in the north they located a previously unknown biotope off Llŷn.

A notable difference with the Victorian naturalists is the increasing use of underwater digital cameras. Organisms such as anemones and the colourful sea slugs can be identified *in situ* from good quality images, so guides are becoming more available to identify them in life.

For marine species there are fewer societies dedicated to the study of particular groups than on land. Nevertheless there are areas where 'citizen scientists' can sometimes outdo the academics. One such is in recording the distribution of molluscs by the Conchological Society. With a network of recorders for Sea Areas (the equivalent of vice-counties on land) and several field meetings in Wales, distributions of many less easily recognised and apparently scarce species are becoming better known.

Fish are another group where distribution recording needs significant input from the interested public. While the more common commercial fish may be adequately known, there are gaps in knowledge, particularly of the smaller species and those seldom seen except by a few anglers.

Diving has greatly advanced knowledge of those gobies and blennies that hide amongst rocks. Projects are being planned to improve the flow of information on the species encountered only occasionally by fishermen, anglers or divers and which are overlooked by the official catch statistics.

Lessons from the BTO's 'citizen science' bird surveys include the value of giving forethought to statistical rigour at the planning stage and maintaining good two-way communications with the volunteers. To do this, some dedicated funding for organisers is needed, but the pay-back in valuable data can fully justify selective investment.

IVOR REES is a marine biologist and formerly was senior lecturer in Ocean Sciences at the University of Wales, Bangor.

Hysbysfwrdd / Noticeboard

If you would like your wildlife event to feature on these pages please contact Mandy Marsh on 01248 385574 or email m.marsh@ccw.gov.uk (entries may be edited). Please mention Natur Cymru if you attend any of these events.

North Wales Wildlife Trust

LACEY LECTURE

23 Nov *Finding the Words: speaking up for Nature.* Dr. Paul Evans wants to 'articulate a way of caring about Nature through his own interest and experience in writing, broadcasting, environmental philosophy and ecology'. Elwy Theatr, Ysgol Glan Clwyd, St. Asaph. Adults £4 (in advance), £5 (at the door), Students £2, Children £1. Available from **NWWT, 376, High Street, Bangor, Gwynedd LL57 1YE. 01248 351541 nwwt@cix.co.uk**

Plas Tan y Bwlch

COURSES

23-25 Oct *The Biodiversity Duty - Focus on Local Action*

29 Oct - 2 Nov *Foundation Course for Countryside Managers and Administrators*

19-23 Nov *Management Planning in the Countryside*

12-16 Nov *Basic Training for Wardens and Rangers*

3-7 Dec *Access and Public Rights of Way, Law and Management*

For more information on these courses please visit **www.plastanybwlch.com** or phone **01766 590324**

School of Education & Lifelong Learning, Aberystwyth

COURSES

1 Oct onwards *Birds Around Cardigan Town.* Knowing what to look for is the key to success in identifying birds. Cilgerran Welsh Wildlife Centre. 5 Sessions on Mondays, 10am.

2 Oct *Birds of Local Nature Reserves.* 10 sessions. This short course will examine the relationships between conservation designation and management and the bird species present.

2 Oct *Coastlines - Form and Function.* 10 sessions. The course will include visits to local beaches to apply the theories of geomorphology and explain what we see.

2 Oct *Introduction to Geology.* 10 sessions. An introduction to to the range of common rocks and minerals, how to recognise them, and how to interpret geological maps.

2 Oct *Landscape Detectives.* 8 Sessions. Including indoor sessions and field trips, this course examines the interpretation of archaeological features in the landscape.

4 Oct *Life in the Seas.* 10 sessions. An introduction to marine organisms and the processes that affect them, from tides to ocean currents.

16 Oct *Nature Reserves and Habitat Survey.* 4 sessions.

For details or to enrol, please contact **learning@aber.ac.uk 01970 621580**

Fenn's, Whixhall & Bettisfield Mosses NNR

14 Oct *A Peat Cutter's Life* 1pm. A stroll around Fenn's Moss with former peat cutter Bill Allmark to learn how life on the Mosses used to be! Meet at Bettisfield old railway station.

14 Nov 7.30 pm, Whitchurch Civic Centre & **22 Nov 7.30 pm**, Senior Club, Chapel Street, Wem *Success Stories from the Mosses* Slideshow, free refreshments. (No need to book.) An update on the NNR's last 15 years.

2 Dec *Come and cut a Xmas Tree,* 10.30 am – 1.00 pm, A495 Fenn's Bank lay-by.

Some events MUST be booked IN ADVANCE – contact Caroline Evans **01743 282005**, or Joan Daniels on **07974 784799 (caroline.evans@naturalengland.org.uk**, or **www.naturalengland.org.uk**) Fenn's, and Whixall Mosses practical volunteering tasks are held on the 2nd Sunday and 4th Thursday of every month. Contact **01948 880362** for details.

Moth Recording in North Wales

PROGRAMME

MOTHERS' UNION - Informal meetings of North Wales Moth Group

1 Oct Pensychnant, Conwy 8pm

15 Oct Treborth, Bangor 8pm

13 Oct *Leaf-miners workshop* led by Norman Lowe. Pensychnant, Conwy 10-4pm

27 Oct *Critical Identification* led by Mike Hull, Treborth, 10-4pm

For further details: Julian Thompson **01492 592595, julian.pensychnant@btinternet.com**

Shared Earth Trust

COURSES

21-23 Nov *Guide to Environmental Impact Assessment module 2* (LLL) £50

Contact **01570 493358, www.shared-earth-trust.org.uk**

Marcher Apple Network and Common Ground

THE BIG APPLE

There are many events to celebrate all things Apple. For a programme send SAE to **Common Ground, Gold Hill House, 21, High Street, Shaftesbury, Dorset, SP7 8JE. Tel. 01747 850820** or see **www.marcherapple.net www.commonground.org.uk**.

NB: many events are provisional. You should check details before travelling.

6-7 Oct *Apple Harvest* 11-5pm Erddig (National Trust) nr Wrexham. **01978 355314, Erddig@nationaltrust.org.uk** or see **www.nationaltrust.org.uk**

6 Oct *MAN's Annual Apple Show,* Cider Museum, Hereford, 11-5pm. Sheila Leitch **01497-547354**.

13 Oct *Shropshire Apple Trust's Apple Day,* Coalbrookdale, Ironbridge Gorge, 10-5pm. Tel **01568-780886**.

13-14 Oct *The Big Apple* Herefordshire parishes of the Marcle Ridge. Jackie Denman, **01531 670544.**

20 Oct *Leominster Apple Fair.* 10-4pm. Felicity Norman **01568 780886**.

20 Oct *Tenbury Wells Apple Fest.* Malcolm Salisbury **01584 810836**.

20-21 Oct *Acton Scott Apple Festival.* Nr Church Stretton, Shropshire. Tel. **01694 781306/307**.

20-21 Oct *Annual Cidermaking Festival,* Cider Museum, Hereford. 10-5pm. Tel. **01432 354207**.

27-28 Oct *Flavours of Herefordshire Food Festival.* Hereford race course. Tel. *01432-260621.*

Diolch am y lluniau i / For illustrations, thanks to:
Abigail Horsley-Wilson, Mandy Marsh, Natural England, Alastair Robertson, Peter Watson.

Back issues of *Natur Cymru* (Nos 2 - 23) are available priced £2.50

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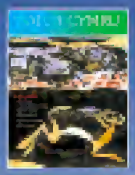
Number Rhif 19



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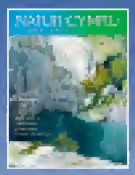

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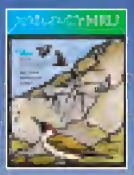

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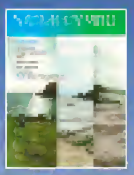

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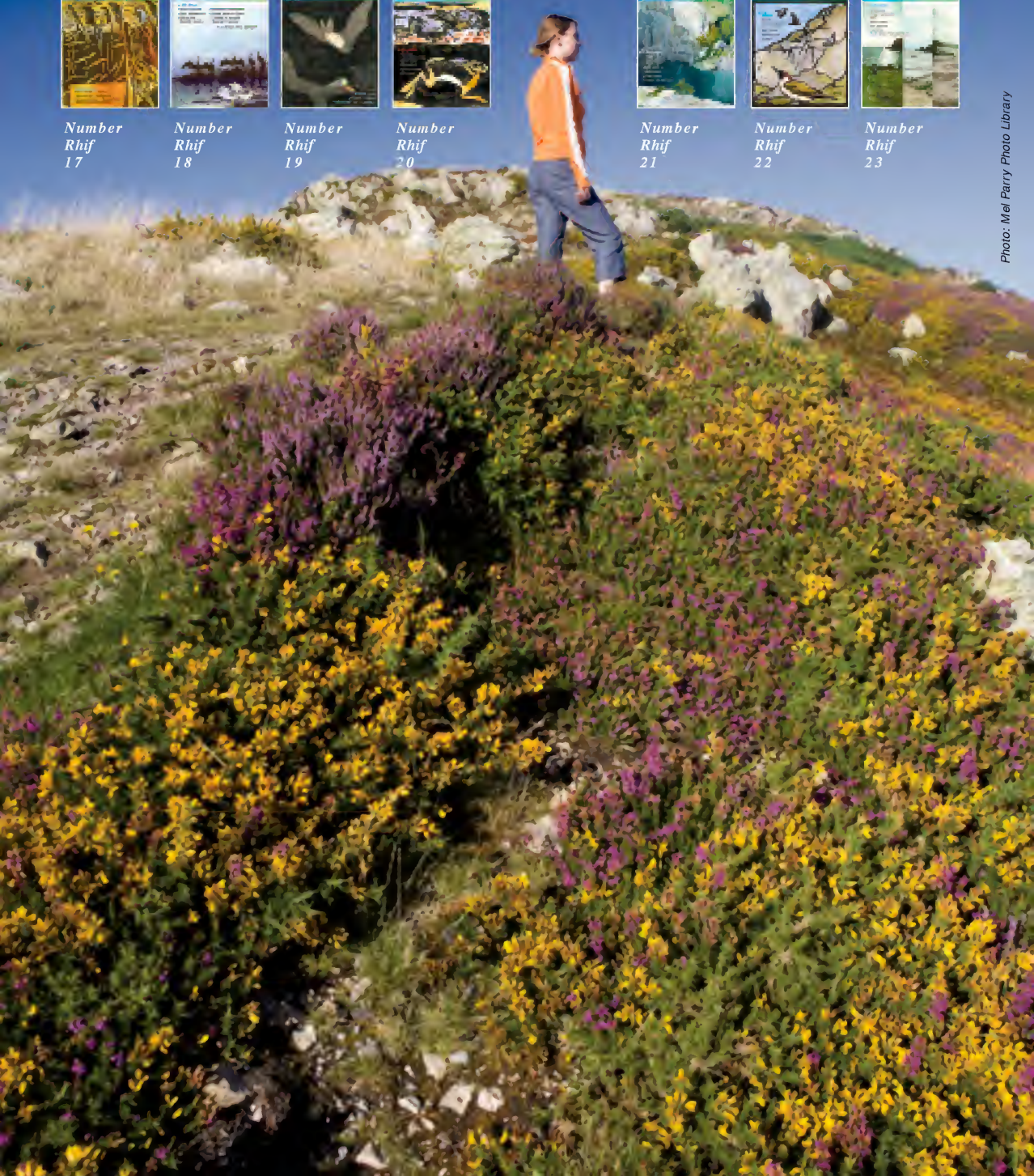

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